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English as a second language and bilingual education teacher perceptions of technology integration in the K-12 classroom

Yurimi Michael Grigsby
University of Tennessee

To the Graduate Council:

I am submitting herewith a dissertation written by Yurimi Michael Grigsby entitled "English as a second language and bilingual education teacher perceptions of technology integration in the K-12 classroom." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Education.

Patricia Davis-Wiley, Major Professor

We have read this dissertation and recommend its acceptance:

Accepted for the Council:

Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

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Gary Skolits

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Ed Counts, Jr.

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John Romeiser

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Accepted for the Council:

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ENGLISH AS A SECOND LANGUAGE AND BILINGUAL EDUCATION TEACHER PERCEPTIONS OF TECHNOLOGY INTEGRATION IN THE K-12 CLASSROOM

A Dissertation
Presented for the
Doctor of Philosophy
Degree
The University of Tennessee, Knoxville

Yurimi M. Grigsby
May 2009

DEDICATION

This dissertation is dedicated to my family and friends (irl and online) for their advice, inspiration, food, encouragement, wine, and laughter, and for knowing when to provide me with either.

"I went up to her and said, 'I know you.' What a small world."
Azam Nemati

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“An intellectual is a person who has discovered something more interesting than sex.” (Aldous Huxley)

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Abstract

Technology for the English language learning classroom offers both benefits and challenges. The purpose of this study was to examine the perceptions of ESL and Bilingual Education teachers, from four school districts, in a large Midwestern region of the United States, concerning the current state of technology for educational purposes; their innovativeness in the strategies they employ in integrating technology in their classrooms; and how they negotiate their instructional needs with what resources they have at their disposal. Specifically, this study sought to answer the following research questions:

1. What type and level of technology do ESL and BE teachers use in their classrooms?
2. How do ESL and BE teachers use technology in their classrooms?
    a. How do they perceive that technology meets their instructional needs?
    b. How do their experiences and instructional goals affect their perceptions?
3. What strategies do ESL and BE teachers employ for integrating technology into instruction?
    a. How have teachers altered or tailored technologies to meet the needs of their specific classes and students?
    b. How can technology better meet the instructional needs of ESL and BE teachers?

The study, using a modified Delphi approach, consisted of two rounds. Findings from the present research revealed that resources for teachers varied even within the same district. The panel of experts reported that the availability of technological resources and an Instructional Technology department (or lack thereof) affected their perceptions of technology integration. Essentially, teachers in this study desired more working computers, more time to learn how to

use software programs, and assistance in using and maintaining the programs and computers. The subjects listed student engagement and enjoyment as a benefit, but viewed the challenges of technology integration enough to resist largely incorporating it in their instruction.

The increased use of technology outside the classroom and possible advantages it offers teachers and students, must be tempered with what resources teachers have available to them through the availability of time, effective training, and district funding. Pedagogical factors and economic considerations can serve as guidelines for teachers and administrators who plan on adopting (more) technology resources in their schools.

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CHAPTER I: INTRODUCTION

In 1994, 3 to 5 million school children spoke English as a second language. (Portes & Zhou, 1994, p. 317). In 2001, one-fifth of America's youth were the children of immigrants (Suarez-Orozco & Suarez-Orozco, 2001, front flap). In 2005, according to 2004-2005 census data, over 5 million English language learners were enrolled in pre-K through grade 12, representing a 56.2% increase in the last ten years of language minority students and 10.5% of the total school-age population. ("NCELA FAQs," 2006, para. 1). How best to educate these children concerns many teachers, researchers, and administrators, all of whom understand that this issue is not likely to abate as the number of students coming from non-English speaking homes increases every year.

As technological advances and gadgets increase, so does reliance on access to technology and its importance to daily life, ranging from business to personal uses. Most American homes in the current population have a minimum of one computer and access to the Internet (U.S. Department of Commerce, 2003, p. 1).

The dependence on, and familiarity with, technology and technological gadgets is even greater for the younger generations who have grown up with computers and use them regularly with comfortable ease. Prensky (2005/2006) refers to today's students as "digital natives" (p. 9) whose cognitive processes are different than the generations who preceded them, whom Prensky refers to as "digital immigrants" (2001b, 10).

Not only do the digital natives use technology for entertainment and social purposes, technology is being integrated into academic settings as well. College students use computers as an important part of their education (Pew Internet & American Life, Project, 2002). For middle

school and high school students, the Internet is used as a major source of information for schoolwork (Ducate & Arnold, 2006).

Critics and supporters of computers in education alike present arguments that are persuasive and one-sided. Computers are expensive and costly to maintain, not to mention the cost of teacher training and support, but advocates of computers and technology (Gee, 2003; Mayer & Moreno, 2002; McFarlene, Williams, & Bonnett, 2000) believe the interactivity of computer-assisted learning will influence students to take more interest in and control over their own learning. In reality, there is no escaping the truth that society has embraced and is utilizing technology's innovations in everyday life.

Within the classroom, technology-enhanced lessons can offer a myriad of ways for students to receive information. There is much literature that exists specifically pairing technology with various disciplines; computers and language teaching have been paired for several years. Issues regarding second language acquisition and technology (Chapelle, 2001), communication and technology (Warschauer & Kern, 2000), and the profession of language teaching (Arno-Macia, Soler-Cervera, & Rueda-Ramos, 2006) are just a few examples of disciplines in which the integration of technology-enhanced teaching and learning is common. While barriers exist in classroom technology integration (Cuban, 1998; 2001), technology can provide additional formats for students to gain language skills. The interactive activities that technology, computers, and multimedia programs inherently offer could and should encourage student interest and create conditions that would induce motivation and participation, and allow the student to work at a pace suitable to his or her language development.

In practice, however, are teachers utilizing technology to their best possible advantage? Factors such as age and prior experience with technology and the Internet, and computers may be decisive factors in determining a teacher's willingness to use it in the classroom. Also, what is available to teachers in terms of school budgets may be limited, even though the teacher may be interested in or willing to implement technology-enhanced activities.

A historical perspective regarding educational technology can help one understand today's current situation regarding technology in the language learning classroom. Olsen (1980) administered a survey to world language departments in over 1,000 four-year colleges. Out of 602 surveys, 527 reported that computer-assisted instruction was not currently in use and would not be considered to be implemented in the near future (p. 341). Views were expressed that demonstrated suspicion toward being able to teach a living language through computers. Even department chairs indicated they thought computer-assisted instruction was a waste of time, energy, and resources. Other responses indicated that the computer might replace the teacher altogether, in essence serving to dehumanize language instruction. As if speaking to this anxiety in 1982, *Time*'s Man of the Year was replaced by the computer (Friedrich, 1983).

To gain further historical perspectives on the use of technology in the classroom, a 1996 study by the RAND Corporation explored the role of technology in the public schools (Roblyer & Edwards, 2000). While some schools were adding equipment at a high rate, others at this time were still found lacking due to insufficient funding. Data within the study suggested the availability of technology in schools that serve poor, minority, and special needs students was not too far behind the averages of all schools. But large disparities exist outside of schools. Some homes may be able to afford one or multiple computers and Internet access, but homes and

neighborhoods of lower socioeconomic levels may still lack many technological resources. Therefore, the issue of access of students of different classes and ethnicities to technology still remains a concern today (Roblyer & Edwards, 2000).

The RAND study also looked at the role teachers had and how new responsibilities and required skills were likely to shift their positions. It appeared the initial preparation of teachers and professional development opportunities for practicing teachers given were not effective in preparing teachers to deal with a technological classroom (Glennan & Melmed, 1996), a sentiment that still exists today (Goldfield, 2001; Russell, Bebell, O'Dwyer, & O'Connor, 2003). The challenge, then, is to train the legions of teachers to integrate new skills and tools into their teaching repertoire (Tapscott, 1998).

Technology has a way of equalizing the student and teacher as either can be the expert on a particular piece of equipment. Moving out of the traditional role of authority may cause fear and result in insecurity for the teacher. When moving outside of predetermined comfort zones, teachers can either use their unease with technology as an excuse to remain disconnected, or they can place greater importance on practice and engagement with the technology before utilizing it in the classroom if unfamiliarity with technology is a concern. "They need to laugh at their own digital immigrant accents, pay attention to how their students learn, and value and honor what their students know. They must remember that they are teaching in the 21st century" (Prensky, 2005/2006, p. 10). Teachers will need to become more tech-savvy as their students are daily becoming even more so.

Many recent studies have examined teachers' use of technology in and out of the classroom. Cuban (2001) reported 8 out of 10 teachers use personal computers to prepare their

classes, host their grade books, and plan their lessons (p. 85). Russell et al. (2003) reported similar findings in that teachers use technology for professional development, communication, and class preparation. These results were supported by Becker (2000), who found teachers' use of technology was limited to tasks that were considered merely housekeeping activities.

Statement of the Problem

Not everyone is convinced that technology has a place in education and academic settings. Some are concerned the increasing presence of technology in schools will exponentially increase disparities that already exist. Neuman (1991) advises that technology and equity do not necessarily go hand in hand. Kozol's (2005) words serve as a reminder and a warning, that schools remain separate and unequal, and therefore, technology cannot be a cause for further inequities and divisions.

While technology offers both benefits and limitations, it is not a cure-all for educational ills. Expectations should be grounded in realistic views that computers and computer-based teaching strategies are integrated parts of a larger picture (Roblyer & Edwards, 2000).

The profession of teaching, too, is a demanding and intensive one. As a result, teachers traditionally do not develop technology materials or a curriculum that would include it. Moreover, what is available can change dramatically and teachers often have a difficult time keeping up with the advances (Roblyer & Edwards, 2000).

Most importantly, teachers remain irreplaceable. What is therefore, necessary, are the teachers who recognize the limits of technology and because of this, do not fear new territories. These teachers will be aware that "whenever a new technology is introduced into society, there

must be a counterbalancing human response…the more high tech (it is), the more high touch (is needed)" (Naisbitt, 1984, p. 35).

Thus, it is important to examine how teachers are using technology and their expectations of its ability to effectively enhance their lessons. This includes alterations they make to current technological resources already available to them, and their suggestions of how technology can be improved to better assist them in their instructional goals. What is significant to this study is teachers' willingness to use technological resources, and what decisions they make regarding them, such as how they apply technology in the classroom, and why they prefer certain resources over others.

Purpose of the Study

The main concern of this research was to explore English as a Second Language (ESL) and Bilingual Education (BE) teachers' critical reflections of the current state of technology for educational purposes; their innovativeness in the strategies they employ in integrating technology; and how they alter technological resources in tailoring them to meet the needs of their specific classes and students. This research will contribute to an area of the literature that is relatively scarce as ESL and BE classrooms, and technology-enhanced lessons for these academic areas, have not been traditionally examined.

Therefore, the purpose of this study was to investigate specifically what type and level of technology ESL and BE teachers are using in their classrooms; what challenges they experience in integrating technology; and what strategies they employ to overcome these challenges. This study will also attempt to identify suggestions ESL and BE teachers may have regarding integrating technology, and how they can create and utilize an interactive, multimedia classroom.

This study aimed to explore these issues with practicing ESL or BE teachers in urban and suburban U.S. school systems and the integration of technology in their lessons. This study focused on ESL and BE teachers for whom technology can be a vital component of the language learning classroom, and can provide meaningful practice, discourse, and cultural connections in a variety of ways.

Significance of the Study

Although technology is ubiquitous in daily life, and its use in academic settings continues to be debated, there is a paucity of literature documenting how most practicing ESL and BE teachers actually integrate technology in their classrooms in order to accommodate the needs of their students. In addition, research has not adequately addressed how teachers perceive the current educational technology available to their students, and what strategies they employ to use technology-enhanced language learning. The findings of this study may therefore contribute to the body of knowledge concerning ESL and BE teachers' integration of technology in their classrooms, including the barriers and obstacles they are confronted with, the successes they experience, and the suggestions they may offer to other educators. Furthermore, the findings may be important in designing and implementing a technology-enhanced curriculum for the educational arena.

This study is important in that it explored how teachers negotiate what they need to accomplish with the resources they have at their disposal. In so doing, it can potentially vocalize teachers' concerns which will lead to curricular revisions more suited to their needs. Technology has such great potential. If the reasons why teachers and their administrations may resist using technology can be identified, it may then be possible to provide them with more effective

training and support, alter course materials, and improve products created by software companies.

Assumptions

This study had several assumptions. First, it was assumed that all participants already use a computer for their personal work. More importantly, it was assumed that all participants in the study were honest in giving their opinions, expressing their feelings, and were truthful in describing instructional strategies, adaptations, and alterations to technological resources they may employ. Finally, it is assumed that the researcher did not lead nor bias the research participants' responses.

Limitations of the Study

This study had several limitations. Only one type of research method was used, a modified Delphi Study. A panel of experts, only drawn from four districts, participated in the study. In addition, a panel of experts, drawn from only four school districts, located in one geographical region of the country, was able to participate in the research study. Therefore, the results of this study cannot be generalized to a greater population.

Research Questions

1. What type and level of technology do ESL and BE teachers use in their classrooms?
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3. What strategies do ESL and BE teachers employ for integrating technology into instruction?
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Definitions of Terms

Definitions of terms that are used throughout this study are provided for the purpose of common understanding of some technical terms between the researcher and the audience.

BE Bilingual Education

CALL Computer-Assisted Language Learning ("Computer-Assisted Language Learning," 2007)

Constructivism

A learning theory, generally attributed to Jean Piaget, that values developmentally-appropriate learning that is initiated by the learner and guided by the teacher ("Constructivism," 2007)

Delphi Technique

A research technique used for forecasting to aid in decision-making, based on information obtained from experts (Landeta, 2006)

ELL English Language Learners

ESL English as a Second Language

ESOL English Speakers of Other Languages

L1 First language

L2 Second language

LEP Limited English Proficient

Mainstream Teachers

General education teachers who teach content

TBE Transitional Bilingual Education, a type of bilingual education program where the students are exited and placed in the mainstream classroom after three years in the program

TELL Technology-Enhanced Language Learning ("Computer-Assisted Language Learning," 2007)

TESOL

Teaching English to Speakers of Other Languages, a professional organization

Organization of the Study

This study is organized into five chapters, followed by a list of references, a bibliography, and appendices.

Chapter One, Introduction, introduces the background of current related research and presents the Introduction of the study, including the Statement of the Problem, the Purpose of the Study, and the Significance of the Study. It also states the research questions which were the focus of the study. Assumptions, Limitations, and Definitions of Terms were also included in this chapter.

Chapter Two, Review of the Literature, presents a review of the relevant literature related to this study. Included in this chapter are the complexities and concerns of technology integration for both the general education and ESL/BE classrooms.

Chapter Three, Methods and Procedures, identifies and describes the research methods and procedures for conducting this research. This includes the selection of the sample, the construction of the research instrument, and methods used for data collection and analysis.

Chapter Four presents a detailed data analysis and the results of this study.

Chapter Five discusses the findings, summary of the results, and their implications, and offers suggestions for further research on the topic.

CHAPTER II: REVIEW OF THE LITERATURE

Since the inclusion of technology in school curricula, a broad discussion has existed in the literature concerning its effectiveness. A number of studies have detailed the effects of educational programs and technology on learning, and what might be learned or gained through their implementation. Also abundant are technology's critics, who believe technology in the classroom is a waste of resources that could be channeled into more appropriate areas. This discussion still continues (Cuban, 2001; Gee, 2003), even as school-aged children continue to invest time and energy on technology tools outside of school, yet within schools, the funding for technology budgets is increasingly threatened ("ISTE says President's proposed budget fails American students," 2007, para. 4).

The questions being raised at present concern the perceptions of teachers toward technology-enhanced teaching and learning and how they negotiate their instructional needs with what they may have at their disposal. Their perceptions and experiences, as well as the adaptations they make in order to be able to make use of their current resources, necessitates defining what technology resources are available to them and how they teach with technology.

Today's learners are in many ways quite unlike prior generations of students. Comfortable with new technologies outside of the classroom, their patience and attention wane when inside the classroom. Often, they must listen to teacher-directed lectures that have little or no interactivity and work, passively and silently, to complete worksheets at their desks. This is the generation after GenX, called GenY ("GenY," 2007), for whom the Internet has always existed, and the generation whose members have grown up comfortably with technology and the

technological gadgets that can still befuddle older generations. What they are exposed to in the classroom is often decades behind what surrounds them outside the classroom.

Multimedia activities offer many advantages to the classroom that teachers have not been able to offer until now. With online course management systems such as WebCT, instructors can upload audio or video clips like Podcasts, a *portmanteau* of the words *iPod* and *broadcast*, which are digital media files distributed over the Internet ("Podcast," 2007). It is a way to deliver information to a large audience via the web that students can access as many times as they wish versus the single time the instructor would traditionally play the clip for students during the class, either on a VHS or DVD player. Specifically for language classes, technological advancements can potentially improve the quality of the target language instruction, but the benefits to students are still dependent on several factors, including teacher innovativeness, availability of equipment, and high-quality packages developed by multimedia companies whose software designers regard teacher input as important (Williams, Boone, & Kingsley, 2004).

The Non-English Speaking, Immigrant Student, Culture, and Language Acquisition

If the technological world outside is changing rapidly, the typical make-up of the classroom is changing just as fast. In 1980, 10% of the children counted by the US census were second-generation immigrants (Portes & Zhou, 1994, p. 317). In 1994, a different survey found approximately 3 to 5 million American students speak English as their second language, speaking a language other than English at home (Portes & Zhou, 1994, p. 317). The foreign-born population for the United States became 31.1 million in 2000, representing 11.1% of the total population (Drucker, 2003, p. 22). Of 3 million public school teachers who answered a survey given by the National Center for Education statistics, 41% said they taught English language

learners (Drucker, 2003, p. 22). In 2005, according to 2004-2005 census data, over 5 million English language learners were enrolled in pre-K through grade 12 (National Clearinghouse for English Language Acquisition, 2006).

The Census Bureau predicts the number of ELLs will only continue to rise. “School-age children whose first language is not English will constitute an estimated 40 percent of the K-12 population in the United States by the year 2030” (Herrera & Murry, 2005, p.5). As the number of students coming from non-English speaking homes increases, the classroom will continue to become more multicultural, and English Language Learners (ELL) will become a common presence. By 2056, Whites will be a minority group as most Americans will be able to trace their ancestry to any place in the world other than Europe (Takaki, 1994, p. 2). The demographics will also change within the school system as “in a mere 35 years, White students will be a minority in every category of public education as we know it today” (Garcia & Cuellar, 2006, p. 2220).

Understanding language acquisition is crucial to the success of the ELL. In 1981, Krashen proposed the theory of comprehensible input (i+1), that explains why, for ELLs, language is not simply *soaked up* as a receptive, passive activity. In other words, ELLs learn English by receiving language at a level that is slightly above their current level. Cummins (1980; 1981a; 1981b; 1996) explained the two types of English ELLs must learn. BICS (Basic Interpersonal Communicative Skills), refers to informal speech such as playground language, and CALP (Cognitive Academic Language Proficiency) refers to academic instruction or textbook language. Collier (1987; 1989; Collier & Thomas, 1989) found that to attain CALP

proficiency, the process can be a long one; sometimes taking up to 10 years depending on the kind of instruction received (Collier, 1989, p. 527).

While strides have been made in understanding language acquisition, more research is necessary to study the inclusion of technology in classrooms that could serve to enhance the quality of instruction and that could increase the rate of language development in ELLs. Could utilizing technology in a classroom setting assist in language acquisition?

Technology and the ESL Student

The typical English language learner requires 2 to 3 (Cummins, 1984b, p. 4) years to develop basic interpersonal communicative skills (Cummins, 1984b) and even longer to develop competency in academic discourse (Thomas & Collier, 1997, p. 635). In many classrooms and districts, students do not receive adequate language support to facilitate language growth as most students spend only a few years in typical ESL or transitional bilingual education programs (Roberts, 1995).

A strong rationale for technology-enhanced lessons is that technology presents many opportunities to positively affect the language growth of English language learners and provide adequate support for language development. There is a critical need to improve education for English language learners, especially for migrant families, as high numbers of migratory students are placed at a greater disadvantage than the language-minority students of families who have chosen to *settle out* (cease being migrants and remain in one community for an extended period of time) within their community. As technology and technological developments become more focused toward educational audiences and arenas, the possibilities for improving language acquisition for language-minority students become more hopeful.

Fast ForWord Language (FFW) is a computer-assisted instructional program that potentially accelerates the development of English language skills. This program focuses on auditory and spoken language comprehension skills through seven interactive, game-like exercises that "provide practice in nonverbal and verbal sound discrimination, vocabulary recognition, and language comprehension" (Troia, 2004, p. 354).

Troia's (2004) study of FFW compared the results of two groups of migrant children, one group that used the program and a control group that did not. All students were tested in five domains before and after administration of the program: 1) spoken English language proficiency; 2) oral language competency; 3) phonological awareness; 4) basic reading skills; and 5) classroom behavior. Results must be interpreted conservatively, due to the author's own conclusions that there were "methodological weaknesses and limited treatment fidelity" (Troia, 2004, p. 353). This refers to the allowance of test substitutions when not all school districts had access to the same set of tests, and concerns for interrater reliability within specific tasks. However, significant improvements were demonstrated in the treatment group in the areas of sight-word recognition, impacting oral language skills and reading performance of the children.

Technology can also assist in building fluency in language with improvements in vocabulary building and reading comprehension. Heinze (2004) offers simple ways that mainstream teachers can utilize technology by minimally altering their current teaching strategies, including using pictures from the Internet to assist in introducing the lessons and to help guide comprehension during reading of texts. Secondly, students can create multilingual books with word-processing programs like Microsoft Word and post their projects online. The use of the native language in projects like these and others can not only improve literacy skill

development in a student's first language, but the skills learned in that student's first language are able to be transferred to the development of English (Snow, Burns, & Griffin, 1998).

As students struggle to understand academic textbooks, multimedia offers interactive ways to guide students through complex material by the integration of videos, satellite broadcasts, digital labs, and electronic journals (Heinze, 2004). Yet as Warschauer asks, "Is technology a tool for language learning, or is language learning a tool with which people can access technology?" (Warschauer, 2002, p. 453). As an example, he describes the situation in which a language teacher can use an e-mail to promote English teaching, but then he or she must also teach English to help their students to communicate effectively by e-mail (Warschauer, 2002). Purpose, use, and goal are important considerations that must be well planned and thought out from the onset of instruction. The curriculum that would include technology enhancements need to do more than simply add a technological unit, strategy, or tool. "Technologies like computer systems belong to the realm of expressive tools of human nature" (Corea, 2000, p. 9). Corea warns against simply forcing technologies at random on people. This perspective of technological innovation that recognizes societal and individual developments within humans is an important one. "We have the hardware, we have the software, but we lack the humanware" (personal communication, 1998, as cited in Warschauer, 2002, p. 472).

Technology, Language and Culture

As language instructors know, however, language and culture go hand in hand, thereby signifying the importance of cultural knowledge in language acquisition. Therefore, it is difficult to understand a language without also understanding the culture(s) of the people who speak it. Common expressions used in everyday language may contain references to food, animals, plant

life, or a particular mindset that is embedded within that particular culture. Without that cultural knowledge, the meaning of the expression is often not conveyable. For instance, a popular Japanese expression is translated to English as, *The lotus flower rises above the mud to bloom*. Important to the Japanese culture (and also prevalent in other Eastern cultures as well) and familiar to the Japanese landscape, the flower is commonly known in Japan to be seeded in muddy waters and climb through the thick mud to bloom large, vibrantly-colored, fragrant flowers on top of the water. The expression is used to encourage others going through hardships and the implied knowledge is that one understands how the flower grows. Without this cultural awareness, the meaning is not easily understood.

Through conversations with Muslim friends from the Middle East, the principal investigator became aware of the fact that while they did not utter profanities in their native languages, they did so in English. For them, English was a language they came to know as adults and therefore, they felt a lesser connection to it than to their first languages. This signifies the power of the words and sentiments in one's native language; the profane words were not real in the language that was not the one associated with home and family.

Therefore, as it is hardly possible to separate a target language and its culture, is it possible for technology to be a viable way to learn a language? Is it possible to teach a language through technology-enhanced lessons if such connections between the culture and language must be present? Can technology teach a culture while assisting in language development? Can a real representation of an entire people, with the connections they hold to religion, to values, beliefs, and traditions, be authentically disseminated through a computer program that is designed to teach language skills?

With all the advances technology has made, it would certainly seem so. Teachers in all disciplines are utilizing the advantages technology offers to enhance their lessons. Language classrooms stand to gain the greatest benefits as technology can bridge the distance between native speakers of target languages and the countries in which they live, as well as the students studying those languages. Technology-enhanced lessons offer alternative ways to present new material that will tap into various modes of learning, in particular by addressing more of the intelligences Gardner (1983; 2000) identified in his theory of Multiple Intelligences, which posits there are different kinds of intelligences, different ways to be *smart*. Because language classrooms deal with all facets of language usage, students must achieve set competency levels in all forms of communication: listening, speaking, reading, and writing. There is a plethora of ways to present and practice language in all of these skills using various technologies.

Growing fast in popularity in language classrooms is Internet-delivered video. The user-friendliness of many social networking sites like Myspace, Facebook, and YouTube offers an easy way to upload videos straight from a webcam. These videos are used in language classes because they are rich resources for authentic language. Instruction with a video can include written transcripts or subtitles as authentic language can be somewhat difficult for non-native speakers to understand (Godwin-Jones, 2007).

Grgurovic and Hegelheimer's (2007) study demonstrates the power of multimedia to improve listening comprehension skills when supported with the right assistance. When given a video to watch, participants utilized subtitles in the target language. In the researchers' study, the availability of a transcript and subtitles was regarded as useful in increasing input when comprehension breakdowns occurred.

Technology, Software, and Learning

Since the computer was introduced into education in the 1970s, technology has been the subject of many research studies as researchers gauge its effects on students, teachers, and their learning environments. Some earlier studies focused specifically on whether software and technology could make a difference on student achievement and motivation (Pollard & Pollard, 2004/2005). Positive effects in language learning have come from such technologies as online chatting to promote learners' noticing, a type of focus on form (FoF) instruction to draw learner attention (Song, 2007), an important cognitive development in second language acquisition (Lai & Zhao, 2006). Teachers can also incorporate the use of blogs, a *portmanteau* for a web log. A blog is a website that provides commentaries on a particular topic and is sometimes used as an online diary. These may be used as teaching tools to promote student engagement and use in the target language (Dieu, 2004). This author posits that quality software can enhance the English language learner's acquisition process as a result of its positive enhancement on vocabulary acquisition.

A study conducted by Williams, Boone, and Kingsley (2004) offers promising outlooks on the efficacy of using software in the classroom. Most of the technology-enabled, software-using educators said they have to tailor activities from software to their own classrooms and saw various needs for improvement, such as user-friendliness, the cost of the programs, and not enough interesting content. However, all saw using software in the classroom as a valuable resource. The last item mentioned, the lack of interesting content, was a theme noted by Roblyer (1988). This researcher stated that poor-quality software is a determining factor in the amount of

computer-assisted instruction in an educator's classroom; if the available software is gauged as being poor quality, educators will stay away from computer-assisted instruction altogether.

Most technology and software aimed at language classrooms have had varying results. While most answer the need for practicing language through drills and repetition, having words on a computer screen alone cannot prevent boredom with and eventual disinterest in the program. Seferoglu's (2005) study of a program aimed at reducing students' accents to help their pronunciation in English through feedback had significant results when comparing two groups of future English teachers, one who used the software and the other who did not. While pronunciation skills increased for those who used the program as compared with those who did not, student reactions to the program were not included in the study. Therefore, the level of motivation and engagement for software with this particular drill and repetition is unknown.

Mainstream teachers who have ESL children in their classrooms are always in need of ways to help them acquire more language. They often do not have the time to give them individual attention and support to facilitate language growth (Heinze, 2004). But teachers can take advantage of the many opportunities that technology offers their classrooms. These recent advancements have been utilized by innovative ESL teachers who have incorporated within their lesson plans text-based online chatting (Lai & Zhao, 2006), blogs (Dieu, 2004), Internet pen-pals, and electronic discussion boards that create a social learning environment (Zha, Kelly, & Park, 2006). The arena of language-learning software has changed, particularly in the area of interactivity. Many programs now offer computer evaluation of the user's progression through the activities and can tailor the program to the user's individual needs. Lab-Volt (2005), for example, is a program that allows the user to complete a short, multiple choice quiz at the end of

each instructional module that provides the participant with immediate feedback for how much content was acquired.

There are programs that offer different approaches depending on the focus the software designers want to emphasize whether vocabulary, grammar, or listening/speaking. Most programs have a Flash-based interface, thereby making exercises dealing with vocabulary and grammatical themes simple to interact with. Listening and speaking activities have improved the most with computer AI (artificial intelligence) able to *hear* the user's accent and gauge whether or not the target word was pronounced correctly. Previous models of speech recognition provided unreliable feedback as it could only understand 90% of native speaker utterances and, at the most, 26% of non-native speaker utterances (Liu, Moore, Graham, & Lee, 2003, p. 255).

Among the more popular ESL software is the Rosetta Stone (2007), both at the high school and elementary levels. It features an easy-to-follow format and a clear, non-confusing interface that immerses the user in the target language immediately and offers a high degree of interactive technology. The interface is such that hardly any instructions are needed to begin. "As far as the customer is concerned, the interface *is* the product" (Raskin, 2000, p. 5). An easy-to-follow format is a way to increase user participation from the start.

CAVOCA (Computer Assisted VOCabulary Acquisition) is a computer program designed to teach vocabulary. It was developed by Utrecht University with a database consisting of "500 words specially selected for their difficulty and relevance to the academic reading needs of Dutch university students" (Groot, 2000, p. 61). There are anywhere from 2,000 to 5,000 words that a learner will see and are necessary for language comprehension (Groot, 2000, p. 62). The generally accepted theory on word acquisition is that there is a natural order to how words

are acquired. Krashen (1989) posits that humans acquire words in a natural order and that they get better at spelling them by reading. Programs like this one, which present words at different stages and in varying degrees of difficulty within structured formats, could potentially assist people in acquiring words at a faster rate than without it (Groot, 2000).

Whether computer equipment and software is easily available to the classroom or not, teacher training must be considered as equally important. Teachers must have multiple and ongoing opportunities to not only develop their expertise in technology, but also their understanding of the value of technology and its potential usefulness in the classroom (Alden, n.d.). In addition, teacher training on technology must be directly relevant to teachers, providing additional support to assist them in their instructional goals, and not simply assigned as required hours of professional development, with no connection to their content areas, content objectives or interests. Pfaffman's (class lecture, February, 2005) research experiences have led him to conclude that most of the technology training imposed on teachers does not lead to increased productivity or engagement with the material, and is usually considered ineffective. When left to their own creative devices, teachers will see more success on their own than in a directed and prescribed workshop.

Evaluating Software

With all the promises software has to offer, there remains a problem with the disconnect between instructional designers of the software and classroom teachers. Teachers use the software relying on the assumption that it has been properly tested. It is not always so (Shiratuddin & Landoni, 2002; Sugar, 2001). Commercial educational software publishers do not make their instructional design process and evaluation procedures available to the public and

rarely are teachers or students invited to join in the evaluation process before the product is placed on the market (Higgins, Boone, & Williams, 2000; Mills, 2001; Williams, Boone, & Kingsley, 2004).

For many instruments, a list of predetermined criteria is used to judge the software. Other instruments exist in checklist format (Gibbs, Graves, & Bernas, 2001). But the evaluation instrument used is often criticized, offering no reliability. Most are simply confusing, criticized for not being comprehensive enough or easy to use (Chang & Osguthorpe, 1987). Software adopters and publishers of software reviews use comparative evaluations (Gibbs, Graves, & Bernas, 2001), but the value of even these is questioned because of their subjectivity and because they do not provide enough information about program effectiveness (Dudley-Marling & Owston, 1987; Heller, 1991; Jolicoeur & Berger, 1986; 1988; Schueckler & Shuell, 1989; Shuell & Schueckler, 1989; Zahner, Reiser, Dick, & Gill, 1992).

Generally, educational software falls into one of four categories (Hannafin & Peck, 1988): drill and practice, tutorial, simulation and instructional game, and problem-solving. During the 1980s, not much was available in the way of software containing quality instruction (Gibbs, Graves, & Bernas, 2001).

Cuban's (1986; 2000) position that the presence of technology is useless in a classroom is still a strong, valid caution against spending millions of dollars on computers and programs that teachers do not utilize. However, Duke (2000) found through her study of the availability of print in high- and low- socioeconomic schools, that rich schools had more printed materials than poorer schools. However, just because printed materials are available does not mean students have more opportunities to use them. Teachers must implement literacy opportunities in their

lesson planning, create a rich, textual environment, and support the learners' use of literary materials (Duke, 2000). In other words, the teachers must be creative and flexible in their lessons and believe in the importance of the inclusion of print. So it must be with Cuban's (1986; 2000) argument that technology and all its components do not by themselves make a difference in student achievement. Teachers must be able to select quality software (and for that, quality software must be available) and use the programs creatively within their lesson planning to promote student engagement and support their cognitive development.

Positive Properties of Quality Software

Quality software shares similar properties as well as similar goals for the user. It is the purpose of this dissertation to explore and identify the positive properties that enhance comprehension that could impact a variety of educators' classrooms.

Several articles point to keys to success that can be used to determine a basic understanding of what well-designed software looks like in terms of presenting the content. Most studies show extraneous material such as unnecessary sound effects, moving animations and graphics, and including large amounts of information as onscreen text just to increase the entertainment value can actually be more detrimental to learning than enhancing it (Mayer, Heiser, & Loss, 2001; Moreno & Mayer, 2000). Focusing and streamlining the material in a prudent fashion increases the level of retention, but this does not mean the environment must be barren. Mayer and Moreno (2002) point to effective uses of animation that can be used to aid in learning via multimedia platforms. Their cognitive theory of multimedia learning complements three facets of learning: 1) the dual channel (i.e., humans have separate channels for processing visual and auditory representatives); 2) the limited capacity assumption (i.e., only a few pieces of

information can be processed via each channel at any one time); and 3) active processing (i.e., meaningful learning occurs when the learner engages in relevant material). Effective use of animation in software can promote learner understanding when it is used in ways that are complementary and consistent with this cognitive theory of multimedia learning.

Serious, Games-Based Learning within Technological Platforms and New Literacies

New horizons are being offered to traditional classrooms as a greater amount of research focuses on serious, games-based learning than before. Understanding cognitive development within videogames offers increased understanding for how cognitive development occurs within the realms of literacy (Gee, 2003). As videogames and videogaming become more pervasive, researchers from higher education institutions are gauging the effects of utilizing these types of game formats (Childress & Braswell, 2006; Rice, 2007; Shaffer, Squire, Halverson, & Gee, 2005) as more professors are accepting and using games-based learning to develop concepts of their curriculum (Boyce, 2006).

Computer games and learning have been unnecessarily at dichotomous ends. Computer games and higher education are similar species that share a common ancestor since, initially, the earliest computer games in the 1960s were actually developed by computer science departments (Herz, 2005). Many games published by educational companies sacrifice enjoyment when they focus solely on education (Herz, 2005). On the other hand, games that are pure entertainment do not have educational goals in their content, but there exists potential. Purushotma (2005) describes playing the Sims game in English noticing, while he took the characters through tasks in their daily lives, that he was seeing the same vocabulary words in the game that he was supposed to be studying for his German homework. By modifying the game to make it a

bilingual environment, users could have enough L1 (first language) support in an environment rich with associations and embedded context in the L2 (second language), thus, increasing vocabulary acquisition without sacrificing entertainment and enjoyment. Open-ended games like these offer a way to practice, succeed or fail, in a private, non-threatening environment.

Videogames and gaming as a situated, apprenticed, and social activity

Lave and Wenger's (1991) Situated Learning theory offers a connection between the social aspect of a person and learning, supporting the idea that knowledge is constructed through participation in a social process (Mazzoni & Gambrell, 2003). This has called for the importance of current research on online games called Massively Multi-player Online Role-Playing Games (or MMORPGs). Games such as *World of Warcraft* and *Everquest,* are popular because the social network in which the players participate mimics the natural way in which apprentices learned their trade. MMORPGs support the position that learning is not simply the direct result of teaching; instead, it is through active engagement and participation in a community that knowledge gets transferred, much the way an apprentice learns his or her skills by doing, benefiting from the overseeing tutelage of a master. This way of transferring knowledge gives importance to vocational education, on-the-job training, and other forms of apprenticeship, enlightening current views on conventional ways of teaching and learning. Learning takes place through the acquisition of knowledge and it is through actively participating in a community that knowledge is transferred (Lave & Wenger, 1991). Therefore, online games could be used as an example of a format conducive to learning through its socially-dependent, player-based society.

This new trend of games-based learning needs significantly more research on how students learn through games and whether or not this type of approach could be used in a

language learning setting. While studies have been conducted that show computer software is effective for learning, explaining the military's use of simulators for flight training, and engineers' use of programs for simulations and data analysis (Prensky, 2001a), few studies have employed computer software (specifically games) to study effective ways to teach ESL students more vocabulary. Troia's (2004) research on the program Fast ForWord Language, for migrant students with limited English, asked the question of whether games could combine fun and learning effectively.

Gee (2003) shows teachers at conferences a video game strategy guide that is a manual of written technical information. He asks them to read through it, and later, how much they understood. Often, the teachers are frustrated; only some of the teachers are able to understand the information at a literal level. But knowing the information and being able to use it in a different context are two different things. Knowing something in the literal sense, divorced from any other context, does not mean the student will be able to recall the information again without the support of also knowing it in context. When meanings are situated in context, (i.e., embodied in experience), then learning takes place (Gee, 2003).

This explains why most video game players read the manual minimally or not at all, preferring to learn by playing the game. This also explains why learning vocabulary in a contextual environment is easier and students may be more motivated to learn the names of things than completing the drudgery of homework exercises in a textbook.

Designers of educational games employ the same strategies that educators do, which include roleplaying, solving puzzles, and the use of feedback that result from participation and interaction with others (Dickey, 2005). The gaming environment is rich for cognitive

development; the active participation in games requires the user to interact with his or her environment and utilize problem solving and discovery during gameplay. Dickey (2005) identified similar goals that designers of games and designers of educational software shared, such as choice, challenging tasks, affirmation of performance in the form of rewards and feedback, and focused goals. “Computer and video games are a prevalent form of entertainment in which the purpose of the design is to engage players in ‘gameplay.’ These strategies and tactics may provide instructional designers with new methods for engaging learners” (p. 67).

New Literacies

Technology has made possible a new area of activities, typically labeled as *new literacies*. These types of activities include but are not limited to: videogaming, fanzines (small circulation publications produced by fans of a particular topic), and blogging. School-aged children are participating, and more importantly they are producing, in these practices. It is then imperative that we broaden our concepts of literacy to include the reading and writing contributions they are making in these practices. “Print supports linear argument, but it does not value aspects of experience that cannot be contained in books” (Daley, 2003, 35).

As these new cultural practices erupt and evolve into daily activities, so are created the approaches used for studying them. A highly regarded approach of studying and understanding the new literacies is from a sociocultural perspective, which considers reading and writing within the “social, cultural, political, economic, historical” (Lankshear & Knobel, 2007, 1) contexts in which they live. This perspective adopts the stance that literacy cannot be effectively researched if it is divorced from the effects or influences from these contexts. “There is no practice without meaning, just as there is no meaning outside of practice” (Lankshear & Knobel, 2007, 2).

Since human practices involve meaning, so too do they involve the society in which those meanings are expressed. As schools continue to offer technological resources like computers and utilize educational programs for use in the classroom, it might be helpful to consider computer literacy skills within society. This involves understanding, within education, the teachers and schools who will purchase and teach with the programs, and the students who will use them. This regard for the influence of culture on the individual was considered by Bruner (1986) as well as Gee (1999), who defined literacy in relation to discourse, as a socially recognized way of using language. With regard to computer literacy, it is difficult for teachers to utilize a medium of instruction that they are not well-versed in, and in which their audience of students will be. Traditional hierarchies become heterarchies and teachers may be uncomfortable with this role of shared or even lost power.

Technology as an Effective Tool for Learning

The potential benefits of technology in education are numerous, specifically pertaining to the English as a second language classroom. Computers and technology can provide ESL students with a vast array of opportunities to receive English language instruction through authentic language activities, a necessary component of meaningful instruction. And as technology develops, what is available for teachers in course materials continues to improve (Roblyer & Edwards, 2000).

Teachers who follow a constructivist philosophy (Counts, 2004) will immediately see the advantages and the benefits of integrating technology in the classroom as technology lends itself easily to open-ended student creations with its high interactivity and manipulability factors. Constructivism ("Constructivism," 2007) as a philosophy values the learner's individual abilities

and interests. The responsibility of internalizing knowledge is placed on the learner and only facilitated by the teacher. The options that multimedia offers teachers to assist their students in creating their own projects range widely, from using a camera to take pictures to create an online photo album to using authoring software to create their own games. Indeed, the very nature of multimedia technologies makes it a perfect outlet for student creativity.

Technology and Socioeconomic Levels

For technology to have the most impact that is positive and powerful in the classroom means further discussion is necessary to ensure technology does not have negative consequences in schools and on schooling. Thirty years ago, Molnar (1978) presented technology as a double-edged sword in education. Becker's later (1985; 1986a; 1986b) demographic studies drew correlations between a school's socioeconomic levels of the communities it serves and its levels of general resources that are available to the school. Considering these implications, Lockard, Abrams, and Many (1994) state this is expected as "Computers only call further attention to the fact that schools in the U.S. are anything but equal. Inequities affect everything from basic supplies such as paper and pencils to library resources and even the quality of teachers" (p. 411). Students who attend wealthier schools are more likely to have access to technology resources at their disposal at home than students who live in poorer communities and who attend their community's poorer neighborhood school.

Technology and At-Risk Students

In the case of at-risk students, Kozma and Croninger (1992) offer ways in which technology might help to address their specific needs. Through technology-based methods,

motivation and engagement can be encouraged by gaining the learner's attention, providing the student with more control over his or her own learning, and subsequently, what he or she produces. Moreover, technology skills, once desirable, are now becoming required job skills (Roblyer & Edwards, 2000). Students will need to be exposed to this type of literacy if they are to compete and succeed in the job market after high school.

Technology and Multicultural Education

Another area of concern falls within the boundaries of multicultural education. Technology can assist in developing and promoting communication among different cultures. Roblyer, Dozier-Henry, and Burnette (1996) describe several multimedia applications that could enhance the ESL and ESOL classrooms in addressing and explaining various aspects of culture and functioning as an assistant in acquiring English as a second language. Green (2005) posits that technology can play an integral part in "providing EL students with valuable language experiences as they learn a new language. Computers can be used to help provide additional language learning opportunities for EL students that take place beyond normal classroom instruction" (p. 56).

Technology's abilities so far have been limited in achieving the overall concept and tenets of what multicultural education tries to promote (Roblyer et al., 1996). Teaching students about other people, places, cultures and cultural concepts (those things a society reveres, fears, honors), can be superficial and at worst, can draw attention to differences instead of focusing on commonalities. Technology can make knowledge of other cultures readily available but "the next steps are more difficult because they require accepting, learning from, and appreciating people of other cultures" (Roblyer & Edwards, 2000, p. 21).

This issue is further complicated as the question has been raised whether computers and the willingness to use them is an issue that could be explained by cultural factors, as Whites are more likely to have home computers or have used the Internet in other locations (i.e., schools, libraries) than African Americans (Hoffman & Novak, 1998) or Hispanics, although the Latino population is increasingly becoming more wired (Schlosberg, n.d.).

Other cultural factors include the phenomenon of acculturation. Acculturation into American society depends on a person acquiring a set body of knowledge and skills that help that person exist and perform successfully in the culture ("Acculturation," 2007). This process is defined as cultural literacy (Hirsch, 2001). Hirsch predicts that higher levels of communication skills will be necessary for a student to gain cultural literacy and that technology has great potential to assist in effective, socially-responsible acculturation of English language learners.

Technology and Gender

Another concern that could undermine technology's advantages is the role gender is seen as having when it comes to using computers. Research shows that boys use computers more than girls (Bohlin, 1993; Sanders, 1993). Margolis and Fisher (2002) liken computer science, and subsequently the job market after the degree, to a boys' clubhouse where girls are not seen, heard, represented, and not invited to join. "As featured in a 30-year-old children's book titled *I'm Glad I'm a Boy! I'm Glad I'm a Girl!*, the gender distinction 'boys invent things and girls use things that boys invent' remains uncomfortably true today" (p. 2).

The reasons for this small number of women in the field of computer science and females who consider themselves to be proficient computer-users may be hidden as well as overt. Subtle reasons are the portrayals of male computer-users on television or the lack of female computer

teachers as role models. More overt reasons could stem from software and videogames that use competition and content that appeals more to boys than to girls (Roblyer & Edwards, 2000).

Technology and Students with Special Needs

Another issue is that of special-needs students. Whether the area of concern is socio-economic, cultural, or gender-specific, schools in rural areas are likely to suffer more severe inequities than those in urban areas, emphasizing a divide in rural and urban resources and expertise of teachers when it comes to servicing the special-needs population (Holland, 1995; Thurston, 1990). Students with disabilities are not only found to be disenfranchised with schools' lack of funding for adaptive devices and locations of computers that are not wheelchair accessible (Engler, 1992; Neuman, 1991), but with the type of instruction they receive as well. Such special populations of students typically have contact with computers that is often only for remedial drill and lower-order cognitive applications. Since these students are often at-risk as well, students could benefit from teachers utilizing the same techniques with at-risk students as with learning-disabled students to inspire and encourage motivation (Engler, 1992; Fredman, 1990; Roblyer & Edwards, 2000).

Far beyond the question of what it means to be educated (Kohn, 2003), where the purpose of schooling might be for economic reasons or civic duties, one needs to consider instead the possibility that a quality school will produce students who can solve problems and create solutions based on information (i.e., academic knowledge, problem-solving skills, technological literacy) they have acquired. Their education and subsequent success as adults will consist of utilizing the knowledge and technological skills they possess. With even the simplest of technology innovations becoming must-have staples in today's society as reliance and

dependence on them grows, it must be ensured that students will have access to technology and be able to receive proper instruction toward becoming competent manipulators of it.

For each of these concerns, the underlying message is clear: economic advantage often turns out to be an educational advantage as well (Anyon, 1980; Warschauer, 2003). But these concerns need not be discriminatory reasons to turn against the technological tide. Specifically, for the language learning classroom, the integration of technology can provide unique environments or offer meaningful contributions to a traditional learning environment.

Technology and the Curriculum

In order to accomplish this, however, there needs to be a well-rounded curriculum to support this endeavor. Henson (2006) speaks of a well-rounded curriculum as having aims that are lifelong learning goals, goals that are measurable within a shorter period of time, and objectives that are the daily tasks that serve to achieve both. Goals and objectives must underlie the broader picture, encompassing the aims. Therefore, a classroom that serves to incorporate technology-enhanced goals must have technology as its bigger picture. In other words technology must be a broad-reaching aim, not just a mere component. The thinking and discussion of technology should not be limited to its mere *use* and should include its effects on the individual and society.

Cuban's (1986; 2000) views on using technology in the classroom have not changed since he posited that it is not the technology that affects student learning. Instead, it is as a result of the instructional strategy and subsequent delivery of the material. In other words, the same effect would have been achieved with or without the technological aspect. Therefore, it serves little purpose to include technology, either as a way to deliver information to students or as a way

to facilitate practice of the material, just for technology's sake, and not as an integral thread woven throughout the multiple themes of a curriculum.

Technology can be as simple as utilizing instructional videos to teach culture to World Language students (Herron, Dubreil, Corrie, & Cole, 2000) or using web-based environments and roleplaying to help facilitate a collaborative learning environment and construct knowledge on subjects like imperialism (Arvaja, Rasku-Puttonen, Hakkinem, & Etelapelto, 2003). Hannafin and Land (1997) state the best teaching methods are those that encourage divergent and independent reasoning, problem-solving, and critical thinking. The methodology that best correlates to these skills is the student-centered learning environment, where technological advances can augment and support cognitive processes. Technological utilization can also be an even greater benefit to a direct instruction classroom and perhaps act as an equalizer in the classroom where students see little technology elsewhere.

Without question, solid, technological advances can help to improve instructional delivery. In the fields of ESL and technology, the focus is now on the language learner (instead of the technology itself), and on what the software can provide in the areas of interactivity and lessons presented in a contextual format.

More studies have fueled the debate of whether or not technology can make a difference regarding software and its efficacy. McFarlene, Williams, and Bonnett (2000) gauged the opportunity for students to take part in their educational experience by creating their own multimedia documents using the program called HyperStudio (2007), a multimedia authoring program. Multimedia authorizing software offers a myriad of opportunities that can create authentic learning through meaningful, personal activities. They conclude that this type of

software can be effectively used as an alternative or supplementary means of assessment and as a powerful diagnostic tool.

Clark (1994) posited that media will never influence learning and that whatever educational gains do occur, it is because of the teaching strategy (the medium of instruction) used and that similar results would have occurred with or without a computer. In other words, Clark maintains that the learning results are not technology-related. Later, Ross (1994) concluded that articles that try to answer the question of whether or not media influences learning are actually confusing the effects of the media with the instructional strategies used. What seems to get little attention in the debates is the concept of motivation in students for using media.

Therefore, the essential question for media and learning is how the results of such comparisons should be interpreted. Is the defining factor the media or are there other variables to consider? The answer is significant because assigning too much influence on media may lead to the creation of ineffective products that are sold only because they use interactive video or another form of *high-status* delivery. On the other hand, assigning too little influence on media may impede the creativity of software and its evaluators, which leaves educators with no technological advocates (Ross, 1994).

While this debate continues, Kozma (1994) states that educational technology is a design science, not a natural science, and offers hope that it can be tailored toward activities that can and will inspire learning and knowledge. Believing the debate to be about the wrong issue, Jonassen, Campbell, and Davidson (1994) state that design is not about manipulating the learning processes but with supporting and utilizing the best that human thinking and learning

have to offer. The debate should not center on media attributes versus instructional methods, but on whether media can support the learning process without controlling it.

While all the promise and potential for today's schools through the use of technology require changes in the classrooms and in the educators' mindsets to facilitate its use, the same goes for efficaciously implementing software. The changes that most often happen with increased levels of technology use are positive and include increased student autonomy, variation in student role, and a shift in the teacher-student, student-teacher relationship (Schofield & Davidson, 2002). The latter identified other relevant changes in curriculum, people, and resources that occurred with simply utilizing more Internet use in the classroom. This included increased contact with those outside the school, the ability to create more authentic contexts for learning, and more access to timely and extensive resources where teachers took advantage of the Internet access either for their own use or inviting the students to carry out relevant online searches. Yet Cuban's (1998) words of caution against supporting technology integration blindly are worth bearing in mind when considering the effects of technological components in the classroom. Are any results due to the technological component itself, or are they a result of the teacher and his or her pedagogy? If the technological component were to be taken away, would the results be the same?

Technology offers great potential for the ESL and Bilingual Education classroom whose English language learners can benefit from the teachers' levels of skill and expertise in multiple areas (i.e., incorporating multimedia and software authoring programs), however, the research reports that teachers must be critically aware of how best to take advantage of these possible

opportunities. This means that ESL and BE teachers need to understand the implications for, the limitations of, and the potential for technology integration in the classroom.

Chapter Summary

This chapter presented a literature review related to several issues related to concerns and issues of technology integration in schools. Several perspectives demonstrate the multiple aspects of technology that must be considered, from how technology can improve access to education and not be a factor in creating further disparity between low and high socio-economic schools, to how technology can be used to advance the education of language minority students. Its multi-faceted abilities that facilitate its use in any classroom and with any content area call for greater access to technology and technological tools than has previously been achieved. The review of the published research on technology integration in the classroom (with emphasis on K-12) reveals a number of issues related to pedagogy (e.g., Second Language Acquisition, Instructional and Educational Technology, Serious Games-Based Learning, and New Literacies) that need to be addressed in an approach to evaluating technology integration. The next Chapter, Chapter Three, will describe the design of the study, including methods, instrument, and participants.

CHAPTER III: METHODS AND PROCEDURES

This chapter will describe the research design underpinning this study and the methods and procedures followed for data collection and analysis. At present, teachers use technology for various tasks, for both administrative and instructional purposes. This study examined the perspectives of practicing ESL and BE K-12 teachers on how they use technology with their language minority students.

A descriptive research design was used in this study. In the early stages of this research, prevalent challenges and benefits to providing technology-enhanced teaching and learning were identified by the researcher, based on theoretical and applied findings described in the literature review, which served as a guide for topics to include as questions for a two round Delphi-type survey. Multiple perspectives in various fields exist that focus on some aspect of technology, and research in the following disciplines pertaining to the issue of K-12 technology integration were used as sources for constructing questions. These fields included: Instructional and Educational Technology research articles and textbooks, Second Language Acquisition research articles related to technology integration in language learning classrooms, books and research articles from the field of Serious, Games-Based Learning, and New Literacies books and textbooks.

Based on the review and analysis of the literature, a set of questions was developed by the principal investigator and incorporated into a survey, which was subsequently given to K-12 ESL and BE teachers.

Research Questions

The research questions asked in this study are:

1. What type and level of technology do ESL and BE teachers use in their classrooms?

2. How do ESL and BE teachers use technology in their classrooms?

   a. How do they perceive that technology meets their instructional needs?

   b. How do their experiences and instructional goals affect their perceptions?

3. What strategies do ESL and BE teachers employ for integrating technology into instruction?

   a. How have teachers altered or tailored technologies to meet the needs of their specific classes and students?

   b. How can technology better meet the instructional needs of ESL and BE teachers?

Research Design

In order to answer the questions raised in the study, the following descriptive research design was developed and implemented by the researcher. It consisted of the following three phases.

Phase One: The districts located in or near a large Midwestern region of the US were selected by the researcher. The researcher then contacted both district level and building principal administrators to inform them of the intents and purposes of the study and seek permission to conduct the study in their districts. Once their approval was obtained, a list of potential teacher-subjects was identified by the administration in each school district.

Phase Two: A set of questions was developed by the principal investigator and given to the teachers identified in Phase One. Two teachers from one of the districts were asked to complete the survey as a pilot study to ensure there

were no unclear directions. Based on their responses, a cleaner instrument was developed by the principal investigator for the Round One survey.

Phase Three: To ensure validation and reach consensus from the set of questions in Phase Two, a modified Delphi method, using a two-stage survey methodology, was employed. The purpose of this phase was to elicit open and honest answers from ESL and BE teachers (Round One), followed by a second survey (Round Two) designed to reach consensus.

Phase One: Recruiting the Panel of Experts

The names of districts in a large Midwestern region of the United States were identified and these districts were contacted by the researcher (Appendix D). District personnel were told of the purpose of the research study. After gaining approval at this level from 4 out of 6 superintendents, which included following strict procedural guidelines involving paperwork and numerous face-to-face meetings, the researcher contacted 26 principals and either engaged in meetings, spoke on the phone, or communicated via email (Appendix E) with them. Nine principals agreed to allow the researcher access to their ESL and/or BE staff. The principals who declined the invitation felt the research study was an additional task and did not want to burden their teachers further. Some stated the time the research study was taking place was too close to the timing of when the state-mandated testing would be taking place (early to mid-Spring), for which the teachers were constantly preparing their students. With the small number of principals who agreed to allow their staff to participate in the study, the researcher had access to 49 teachers. Out of 49 teachers contacted, only 21 teachers agreed to participate in the study

(Appendix F). The names and contact information for these teachers were given to the principal investigator by the principals.

Phase Two: Constructing a Set of Questions

This phase consisted of the organization of the survey questions by the researcher from multiple perspectives in fields which focus, wholly or peripherally, on some aspect of technology integration. These diverse fields guided the researcher in constructing specific questions that would address the original research questions.

The survey for Round One (Appendix A) was created by the researcher and consisted of 16 open-ended questions designed to explore the resources currently available to teachers and seek to identify the ways teachers currently use technology in and for their classrooms.

Phase Three: Conducting a Modified Delphi Study

The principal investigator utilized a modified Delphi study in order to deeply probe the set of questions used in Phase Two of this study. Similar to a Delphi study, a technique successfully used by many researchers for similar purposes, this study used a panel of experts and had multiple rounds (two for this study) for its data collection procedures.

Based on answers provided by teachers on the Round One survey, an analysis was then conducted by the researcher to further gather information on the frequency and importance of the ratings on each of the items from practicing K-12 ESL and BE teachers. Results from Round One were complied into a checklist for Round Two and given back to the teachers (Appendix J), from which deeper insights were obtained from written teacher responses.

The modified Delphi method applied in this study is described below, followed by specifics of its implementation in the current research study.

The Delphi Technique

The purpose of all research is to better understand the world in which one lives (Merriam, 1998) and the goal of this particular research study was to understand K-12 technology integration from the perspective of practicing teachers. Unlike qualitative research, quantitative studies have the ability to be broadly generalized to a large population in part due to the larger sample sizes involved. Within quantitative research, there exist numerous designs to achieve a study's objectives. However, in order to explore the questions that were raised by this study, which are what type and level of technology are being integrated by ESL and BE teachers, what challenges they experience in doing this, and what strategies they employ to overcome these challenges, the research method selected by this researcher was a modified Delphi technique supported by mixed methods, which had the advantage of incorporating both qualitative and quantitative methods. The researcher found this to be a practical, efficient approach, and one that could benefit the English language learning classroom and other content area classrooms as well. This method accomplished the goals of the research study by generating discussion and new ideas through compared experiences, and explored the unique opinions and creative strategies of practicing ESL and BE teachers.

The Delphi method was developed by the RAND Corporation in the 1950s at the beginning of the Cold War (Cuhls, n.d.; Rowe & Wright, 1999) as a forecasting tool, to study technology's impact on warfare ("Delphi Method," 2008). This technique involves two or more rounds of surveys given to selected participants. It is designed to be an interactive process of

administering multiple survey rounds until a consensus is reached by the participants. It is a method designed for the "systematic solicitation and collation of judgments on a particular topic through a set of carefully designed sequential questionnaires interspersed with summarized information and feedback of opinions derived from earlier responses" (Delbecq, Van de Ven, & Gustafson, 1975, p. 10, as cited in Methodology-Delphi study, n.d.).

Specifically for the Delphi, the purpose is to accumulate perceptions from participants that will converge in order to offer a "greater consensus amongst panelists over rounds" (Rowe & Wright, 1999, 363) on the topic of interest. Since subjects are not physically required to meet in person, this type and style of inquiry takes full advantage of the participants' time, so it is possible to conduct surveys with people across a wide expanse of geographical areas. While the generated ideas are being re-considered, "It is structured to capitalize on the merits of group problem-solving and minimize the liabilities of group problem-solving" (Dunham, 1996, p. 1).

In face-to-face interactions, group dynamics can influence outcomes by pressure from dominant individuals, expressed hostility, and missing participants. The Delphi offers the advantages of not just the anonymity of respondents, but it gives participants the time to reason and formulate well-thought-out responses to the questions as they relate to their own experiences. Through their written responses, participants can provide as much relevant background information and details of their experiences and perceptions as they desire in a non-threatening, open environment.

While the participants in this study were from one geographic area, they were practicing teachers from four separate school systems and nine different schools, making sit-down, face-to-face participation during the academic school year (the time this research study took place) not

practical. Also, through this research, the panelists in this study reported diverse experiences and perspectives which existed within even the same district.

The results of multiple rounds of surveys seek to reach a consensus so that agreement can then be generated ("Delphi Technique," 1994, para. 2; Rowe & Wright, 1999). The agreement reached by respondents is used to answer the questions of the research study and offer more information than possible through a single survey approach. Because of these advantages, the Delphi technique was deemed to be a sound research strategy for this study.

The Instrument

The researcher developed the instrument (Appendix A) used for Round One in this study. This instrument was created based on topics concerning technology integration from multiple fields identified in the second phase of the study and described earlier in this chapter. The following three sections were developed by reviewing examples from other Delphi studies.

Section A: Demographics of teacher-subjects

Section B: Level and type of technology integration by teachers

Section C: Space for additional comments or concerns

Directions were included on the instrument for the participants to follow for each section of the instrument. The instrument consisted of 16 total items; 7 were basic demographic items, answerable by short answer; 9 items were open-ended, requiring a brief answer.

Four questions in the Round One survey were specifically designed to answer the following research questions: (1) What are the greatest challenges of including technology in the classroom? (2) What are the greatest benefits of including technology in the classroom? (3) What

tasks do you most use/need/want technology for in the classroom? (4) What changes would you most like to see in software or online applications for classroom purposes?

The most frequently-cited responses were organized into a checklist. Participants were asked to rank the items in order of most importance on a 3-level rating scale, with 1 being the *most important* and 3 being the *least important* to them. The participants were then asked to provide a brief explanation for why they chose their top three. Since all participants received the same survey, and since there was only one facilitator, the level of internal reliability was not an issue (Best & Kahn, 1998). Validity of teachers' responses depended on the respondents' critical reflections and truthful comments.

The last section provided participants with an opportunity to state comments or concerns that might not have been addressed in the previous questions. This last section was optional.

The Round Two survey (Appendix J) was created to probe the findings of the first round by the use of a checklist created by the panelists in Round One. The participants rated their top three choices using a 3-point rating scale (1=*most important*; 3=*least important*) and were asked to provide a rationale for why they chose their top three answers.

Procedures

The researcher sought permission from the Office of Research at The University of Tennessee to conduct this survey after the instrument for the modified Delphi study was approved by the researcher's doctoral committee members. An application form for conducting research involving human subjects (Form A) was submitted to the Institutional Review Board (IRB) at The University of Tennessee. Permission was granted from the Office of Research at The University of Tennessee on February 5, 2008.

The researcher then contacted school districts in a large Midwestern region of the U.S. It took several months for the researcher to receive permission from district personnel at the superintendents' level to conduct the research study in their respective districts. After following strict procedural guidelines to receive permission involving paperwork and meetings with district personnel, the researcher gained approval from four districts out of six districts contacted. After receiving permission at the district level, the researcher was then allowed to contact principals within their respective districts in order to gain access to their teachers. Out of 26 principals contacted, only 9 agreed to allow the researcher to contact teachers in their schools. Superintendents and principals gave their consent and a list of potential teacher-subjects was given to the principal investigator by principals at each school site. The researcher contacted 49 teachers in four districts; 21 teachers completed the Round One survey and 18 teachers completed the Round Two survey.

For Round One, the principal investigator created an online survey and gave the URL to participants by email. The online version of the Round One survey (identical to the paper copy) was designed by the researcher with the help of mrInterview, a software program that is part of SPSS' Dimensions market research platform, available through The University of Tennessee for the creation of online surveys. Each question of the survey was presented on a separate web page with convenient navigation between the pages (e.g., NEXT PAGE and PREVIOUS PAGE buttons). Each question had a blank text box underneath it so that respondents could write in their answers. The final page of the survey contained a blank text box to provide room for additional final comments as well as a SUBMIT ANSWERS button.

The online Round One survey was uploaded to the specifically-allotted space on the official University of Tennessee Web server. The researcher was provided with the URL. Once the researcher tested the survey's URL and accounted for all types of data input, the online Round One survey was considered ready for use and went live. A brief introduction explaining the research study was placed on the first web page of the online survey (see Appendix B).

The online survey produced an extremely low response rate by participants, so the remaining participants who had not completed the online survey were sent the Round One survey in a hard copy format by the principal investigator, which produced a higher response rate than the online survey. For the Round Two survey, there was no online survey created. Instead, the researcher opted for only the hard copy format in order to ensure a higher teacher response rate. Once the data were collected from the Round Two surveys, and prior to data analysis, total anonymity of the subjects was maintained to ensure confidentiality.

Role of the Researcher

In conducting this study, the researcher next considered the following issues: the role of the researcher, and research ethics for maintaining confidentiality of participants. The nature of quantitative research tends to be objective and detached ("Ways of approaching research," n.d.) and therefore, the researcher can remain impartial. In a Delphi study, the researcher takes on the role of facilitator as he or she gathers and analyzes the collected responses. Thus, the researcher in this type of study facilitates the generation of new ideas, presents the responses as feedback, and guides the group of participants to an agreed-upon consensus.

Confidentiality Issues

Concerning the confidentiality issues of the research participants, the researcher took proper procedures to protect the research participants. The research was conducted after receiving the permission of the Institutional Review Board so that all research participants' rights were protected. The researcher kept the participants' identities confidential throughout the research. At no time were the names of participants disclosed throughout the study. The collected data were accessible only to the researcher and were then destroyed upon completion of the research.

Data Collection

Recruiting the Panel of Experts

The researcher contacted several urban and suburban school districts in a large, Midwestern region of the continental United States. The researcher spoke each time with administrative personnel and gave a self-introduction, describing the nature and objectives of the study. The benefits of the study and the importance of participation were also given. Four public school district administrations gave their affirmative support. Within these four public school districts, the researcher then contacted 26 schools to speak with principals in order to obtain their permission to contact their teachers. Nine out of 26 principals agreed to allow the principal investigator access to their teachers.

In one of the school systems, a Pre-K through 8th grade district, two ESL teachers travel to different school sites within the district to meet with their students. While selected teachers from content areas may teach ESL students who have been mainstreamed into the regular classroom, only two teachers had the official title of being ESL teachers in this district. In

another of the school systems, a high school (grades 9-12) district, all ESL students in the district were sent to one high school for academic instruction, so only one school was available in this district.

Within another elementary school district, several schools within the district had ESL students, due to the high population of language-minority students from the community. As this particular district was popular with researchers who focus on second language learning reading programs and teaching methods, the principal researcher was allowed to conduct her research study in only two schools within the district.

Pilot Study

A preliminary form of the survey was submitted to the members of the researcher's doctoral committee, who suggested three additional questions in order to clearly draw out relevant themes from teacher responses. The researcher revised the instrument in order to include the suggestions from her committee. After that, a pilot study with the approved and revised research instrument was conducted with 2 selected participants. The small population selected for the pilot study consisted of two Bilingual Education teachers who used technology in their classrooms. The criteria for selecting the pilot study participants were the same as that for the actual research participants. The pilot instrument was given to check for any ambiguity in directions or need for clarification. A cleaner instrument was subsequently developed by the researcher for Round One based on their responses.

During Round One, important distinctions were drawn from teacher responses concerning their perceptions of technology and how they were currently using it in their classrooms. The Delphi process began with an open-ended survey sent to each participant for the

first round of the study. From the completed surveys, a comprehensive list of participants' responses to specific questions was constructed by the researcher. Similar answers were combined and subcategories emerged from the responses. Teacher responses were organized into a list so that the researcher could, through cross-referencing, determine how satisfied the teachers were with their current use of technology in their instruction, how they utilized it to enhance their classroom activities, and how their prior experiences with the technology resources at their school had affected their perceptions of technology integration.

Representative comments from each of the major subcategories were organized into a checklist for participants to rate 1-3 in rank order of *most* to *least important*. Four specific questions were chosen from the first survey and used in Round Two in order to further explore the experiences and perceptions of teachers regarding technology integration. Then, teachers were asked to write a brief rationale for why they chose their top three choices. In total, 21 teachers participated in round one out of 49 teachers contacted and invited to participate.

For the second round, a feedback report of the most frequently-cited responses that were representative of the subcategories that emerged, was given back to the participants in a checklist format. This time, participants were asked to review the checklist of items. They were then asked to complete three tasks: 1) rate the construct in rank order of importance on a 3-level rating scale; 2) select the three most important items from the list with 1 being *the most important*; and 3) provide a brief explanation for choosing their top three items. In total, 18 teachers participated out of 21 contacted with the second round survey.

Analysis of Data

The nature of this study was inductive, which described the opinions from the panel of experts (i.e., ESL or BE teachers) and how they used technology in their classroom and their expectations of what it can do for them. This study had the advantage of having both quantitative and qualitative data gleaned through the responses given by the participants. The qualitative data obtained from the first round of questionnaires were used to establish the content for the second round of questionnaires. The analysis used for the quantitative approach was descriptive in order to gather information from the participants in the attempt to come to a consensus.

The goal of compiling and then ranking the quantitative data was to develop generalizations that will contribute to the fields of ESL and Educational Technology. The questionnaire method employed for this research study identified characteristics of the participating teachers and, it is assumed by the researcher, that these results can be generalized to a larger population.

The researcher reviewed and typed all the given answers to four specific questions from the first Round One survey. Once the typed list was formed, the researcher then divided the answers into categories that emerged from the responses. From these categories, the researcher manually calculated the most frequently-cited responses. All of the answers were tallied, even if one respondent wrote multiple answers. The most frequently-cited responses from each category then became part of the Round Two survey. During the second round, participants reviewed the list of responses and ranked their top three choices on a 3-level rating scale. For their top three choices, participants provided a brief explanation for choosing their top three items.

Data analysis included the following data:

Top three items. Frequency scores were tallied manually on all of the items chosen by the participants as their top three choices.

Narrative rationales. The narrative rationales were examined to see if any additional information was given. Information beyond the reiteration of survey items was reported and used to gain more insight into participants' responses.

3-level rating scale data. The 3-level rating scale information assisted in narrowing the participants' most popular responses in order to reach a consensus of items.

Consensus. Consensus was determined after identifying the most frequent responses to the four questions on the Round Two survey.

Chapter Summary

This chapter discussed methods and procedures used in this research. It described how the criteria were identified and modified for the use of the modified Delphi technique. First, the sources of criteria were identified by the researcher. Second, the criteria were drawn from the identified sources and constructed as questions addressing the criteria. Next, the questions were organized and incorporated into the Round One modified Delphi survey instrument. The survey was tested in a pilot study and then administered to the subjects in the approved school districts. The results of Round One were analyzed, and responses to specific questions were organized into a checklist format for Round Two of the study. The results for Round Two were tallied to determine the importance of each criterion and presence of consensus among the teachers. The results of data collection and analyses of the findings are presented in Chapter Four of this research study.

CHAPTER IV: ANALYSIS OF THE DATA

This chapter presents an analysis of the data collected in the present research study and discussion of the findings. While the published research on technology in the classroom has been plentiful, how best to integrate it so that it meets the needs of practicing teachers remains largely unexplored (Williams, Boone, & Kingsley, 2004). The purpose of the current research was to explore teacher attitudes and perceptions of technology use in the ESL and bilingual classrooms, to identify how these teachers are integrating technology in their classrooms, to address the concerns and needs of the teachers who desired more technology-enhanced language teaching and learning, and what changes they would like to see.

The researcher administered an open-ended survey to teachers of language-minority students in four different school systems in a large Midwestern school system and the surrounding districts, in both urban and suburban settings, at nine different schools, in order to uncover teachers' perceptions of and experiences with technology use in their teaching. Clear themes, shared by a majority of the teachers as being deemed important by them, emerged. Specifically, the researcher attempted to gain an emic (i.e., an insider's) perspective, through insight and understanding, to provide answers to the following research questions:

1. What type and level of technology do ESL and BE teachers use in their classrooms?
2. How do ESL and BE teachers use technology in their classrooms?
    a. How do they perceive that technology meets their instructional needs?
    b. How do their experiences and instructional goals affect their perceptions?
3. What strategies do ESL and BE teachers employ for integrating technology into instruction?

a. How have teachers altered or tailored technologies to meet the needs of their specific classes and students?

b. How can technology better meet the instructional needs of ESL and BE teachers?

A two-phase design was applied to the research study in order to accomplish the purpose and goals of the study. Prior to beginning the construction of the first survey, prevalent challenges and benefits to providing technology-enhanced teaching and learning were identified by the researcher based on theoretical and applied findings described in the literature review, which served as a guide for what types of questions to include on the instrument. Then, the researcher constructed a survey that identified ways teachers are incorporating technology in their classrooms and how they were accomplishing this. The survey was also designed to explore their attitudes and perceptions of technology. Next, a thematic organization was applied to specific questions and their responses, and then these items were categorized into thematic groups (according to the question to which they were responding.)

After construction of the first survey, the principal investigator contacted six school districts and invited them to ask their ESL and bilingual teachers for their voluntary participation in the study. Four districts responded with their approval. The researcher then conducted a pilot test in an attempt to clarify any questions and address any misunderstandings there might be on the instrument due to ambiguity or vagueness of the questions or directions. The first round of the survey instrument was then conducted, followed by a second round. The second survey was constructed incorporating the most frequently-cited responses from the first round of the survey.

Essentially, both rounds of the modified Delphi-like survey were ultimately conducted with participating teachers (who served in the role as experts), in a large urban school district and in three of its neighboring suburban districts, whose students are language minority speakers.

The examination and analysis of the data, as well as the discussion of the findings are presented in this chapter. In order to address the purpose of the study and to answer the research questions which guided the present research, this chapter will be organized into the following sections: Results of Round One, Results of Round Two, Discussion of the Findings, and Chapter Summary.

Round One

The first version of the survey was administered over the Web in an online format, using mrInterview, a software program that is part of SPSS' Dimensions market research platform, available through The University of Tennessee for the creation of online surveys.

Forty-nine ESL and BE teachers were identified to participate in Round One of the study. Out of this population of teachers, drawn from 4 school systems and 9 schools, 6 completed the online survey. In an attempt to gain more participants, the researcher administered the survey again in paper format, this time distributing a paper copy at the respective schools of each teacher who had not already completed the survey online. Through this method, 15 teachers completed the survey for a total of 21 completed surveys, which represented 43% of the total possible number of teacher participants. Of the 21 teachers who participated in Round One, 18 participated in Round Two, representing 86% of the total number of possible teacher participants.

The first part of the survey asked the teachers to disclose basic demographic information including their years of teaching experience, their gender, and what grade levels and subjects they teach. This information was requested in order to identify any correlations to the research data.

The participants, 18 females and 3 males (see Table 1), were K-12 teachers at public schools in a large metropolitan setting in the Midwest. All participants taught language-minority students in a variety of subject areas, including language arts, reading, social studies, science, math, as well as courses dedicated to ESL instruction. Nine of the subjects teach high school, grades 9-12, 5 teach elementary grades K-5, 6 teach in the middle grades 6-8, and 1 teaches in grades K-8 (see Table 2).

The minimum number of years of experience was 5, and the maximum number was 32. The mean number of years was 14.28 (SD = 9.03) from a total N of 21.

The school settings identified by the subjects were urban or suburban and are representative of many school systems across the country. Teachers from 9 schools in 4 different school systems completed Round One and Round Two of the survey. Fifteen teachers responded that their school was a Title 1 school, 4 teachers did not work at Title 1 schools, and 2 did not respond to this question at all (see Table 3). Of those who reported teaching in a Title 1 status school, the number of students who qualified for free and reduced lunches ranged from 80% to 96%. Even those whose schools were not identified as being Title 1 schools had students who qualified for free and reduced lunches, with 55% and 95%, respectively.

All but 2 of the 21 teachers had a personal computer assigned for their own use; however, the availability of computers for student use varied from school to school, even within the same

Table 1

Sex of Participants

Male	3
Female	18

district. Two teachers explained they had been mandated by their administrators not to allow students to use the computers personally assigned to them (i.e., the teachers). Responses of computer availability for student use ranged from "I have my own lab" and "Excellent! We have a computer/language lab just for the use of our department" to "None but the teacher's computer. The antiques can handle grading and attendance only." Some of the students were only allowed time in the computer lab of their school for "one class period of one quarter."

Most of the teachers expressed frustration at having to share a computer lab with all the other teachers in the school as there was limited availability and that within that one lab, there were not enough computers for all the students. At one middle school, the administration had made the decision to give sixth and seventh graders their own laptops, but did not give them to the eighth graders. In two classrooms, teachers had no computer, either for their own personal and work use or for the students. Others could only use the computer lab an allotted 40 minutes per week and other teachers had to use the computer lab in the library.

Almost half of the teachers in the present study had indeed attended workshops and required in-service training for professional development, from which they felt no benefits had occurred. Others were proclaimed self-trained teachers who could read the manual or had prior experiences in their college years in basic computer courses during their undergraduate years or who had signed up for classes offered at the computer center of the school in which they work.

Table 2

Grade Levels of Teachers

High school (grades 9-12)	9
Elementary school (grades K-5)	5
Middle school (grades 6-8)	6
Elementary and middle (grades K-8)	1

Beyond teacher training, though, what was reported by the subjects of this study to be the most helpful, and what was most appreciated by them was a helpful Information Technology (IT) department. The presence of an IT department as a resource within the schools ranged from "none" to a "very interactive IT department" that gave numerous in-services and training workshops on how to use the programs the school currently has. Addressing the question of what computer-based programs teachers used for instructional purposes, teacher responses included a number of resources such as websites (i.e., *wikipedia.com*; *readwritethink.org*; *freerice.com*) to programs specifically useful for their content areas (i.e., Inspiration; Rosetta Stone [by far the most popular among the ESL and BE teachers]; School Helper; as well as PowerPoint.) Responses for computer-based programs for grading purposes ranged from "none" to IntegradePro, e+school, Excel, Gradequick SASI, Classmaster, and Grade Machine. Some respondents said they used these programs extensively while others used them "somewhat" or not at all. Responses for computer-based programs for student use were just as varied, ranging from *none* for Rosetta Stone, Marco Polo, epals, First Class, Rainforest math, Kids Health, Inspiration, and other online sites as well as Microsoft applications (i.e., Excel, Word, PowerPoint).

Table 3

Title 1 Schools

Yes	15
No	4
Did not report	2

Teachers of specific content areas used certain websites to reinforce the learning of concepts within the classroom, yet language arts teachers markedly preferred Word for its ease of correction and legibility in student papers.

In response to the question *What problems do you have with computer-based programs*, teacher responses ranged from *none* to very direct and clear challenges they currently have to work with. Of those teachers who wrote *none*, 2 offered an additional comment by way of explanation, that they have *few* to *no problems* with computer-based programs because they did not use them often.

Other subject responses dealt with lack of time or money. Some had a limited number of computers; few of the teachers were permitted software installations; others had computers that malfunction or overheat regularly; and still subjects stated that while using the many options on the popular program Rosetta Stone, a lot of time was needed for individualized student work in order to find the most appropriate options best suited to their needs. Other comments pointed to a lack of activities to go along with the information presented to students and the lack of available programs in the students' native languages, in addition to the low quality of the software programs.

Students also may be the cause of teacher frustration as students "loose [*sic*] files that have been saved on public computers or the files have been altered by others" so that teacher and student instructional progress over a period of several days is hampered by tampering or deletion of the files by other users or the students' own inability to maintain control of external storage devices such as jump drives.

Specific Challenges for Integrating Technology

For those teachers who were experiencing specific challenges to integrating technology into their instruction, many listed ways in which they had altered their teaching in order to effectively adopt the computer-based programs effectively. Responses ranged again from *none* to very creative ways to be able to achieve a technology-enhanced lesson. One teacher wrote that "we (as a department) have a [*sic*] reorganized our schedules. Every ESL class has 2 periods in our computer lab each week." Another teacher wrote she had modified the language and added graphics, and another wrote he only used Internet sites that are bilingual-friendly. Still others created their own worksheets and other activities, or used tailored, student-specific lesson plans based on the student's progress and level. Another teacher responded that she brings in her own laptop to use in class.

Desired Changes

Regarding changes they would like to see, ESL and BE teachers were adamantly clear in knowing what they want and what they currently did not have. Teachers responded that one ESL software program used by their department was "too easy for kids to cheat" and "needed to be better integrated into the curriculum." Others desired more problem-solving activities in all areas

and more interactive programs, especially for speaking practice components which used microphones. Still others wanted better student-friendly explanations, more helpful translations and bilingual activities, and more activities in the software packages. One teacher responded that most of the programs at her school had components of everything she liked, which included: increasing levels of difficulty depending on student responses to assessments, user-friendly formats, self-correcting, and lots of varieties. This was in stark contrast to another teacher who said, “Start with computers in the classroom.”

Teachers’ Current Perceptions of Technology Resources: Challenges

It appears then, that the current perception of technology resources is varied within each school and, while considered acceptable in some schools, could be much improved in others. The space in which additional comments were requested attested to this as teachers seemed to desire technology, the ability to connect to the world outside their classrooms, and all the resources this can bring into their classroom. Every teacher understood there were benefits to including technology-enhanced lessons into the classroom. One teacher said, “Technology is an important component of education and should be integrated in all content areas” and another said, “It is the best part of teaching and the kids love it.”

However, the reality of what teachers can do, and the problems they will endure, have far-reaching effects on how much technology they will attempt to utilize in the classroom. One teacher said, “I have not used technology much this year” due to the difficulty in coordinating and negotiating time with the computer lab and the challenge of findings specific programs for ESL students.

Others found technology presents its own additional and exhausting hardships with one teacher stating,

> I think the inclusion of technology in the classroom is a great help and a wonderful idea because students are more motivated with the classwork. But it requires attention from teachers and parents while they are writing with computers because students need to be watched where they are in their computers and be reminded of that they need to be working with the work assigned. Technology in the classroom demands more attention of teachers in the classroom while students work.

Another teacher stated, “Almost all our students are more tech savvy than their teachers. The instructors need more time to learn the programs and to become more familiar with the wide variety of tech offerings available to us.”

Time was also addressed in another teacher’s comment, “Time is a factor—with so much to cover it would be difficult to instruct young students on computer usage” and “I’d like to see specific-lesson plans using technology in ESL. It is easier to modify than to build from scratch.” One teacher thought that technology integration was too cumbersome.

> I find that requiring student use of technology during class takes too much time from instruction. Many of our students do not have computers at home on which to practice and do assignments. They come to us with limited skills, which if taught in a content area class, takes away from time learning actual content (in my case—English).

Still others did not see viable ways of including any type of technology, stating, “I sometimes regret the cost of changing technology because it becomes financially prohibitive for my school district” while another presented a dim picture of reality.

> My computer has been full of problems and we have no official tech support. My projector broke so my smartboard hasn't been used in months. I love using technology but can't find the time to troubleshoot hardware problems. I still haven't figured out how to burn a DVD of students' performances.

In contrast to most of the answers, one simply answered, "I wish we had access to computers."

The responses to the next set of questions were used to subsequently construct the second survey. When asked what were the tasks teachers most use/need/want technology for, upon deeper reflection the researcher realized some answers might be different based on which verb respondents chose (i.e., present tense vs. future). However, all teachers answered *vis-à-vis* tasks they currently use technology for (see Table 4). Most listed a single item but some answered giving a list of multiple tasks. All of the responses were counted and included in the final tally, even if one teacher listed multiple tasks.

Listed 25 times were responses that dealt with instruction or instructional support such as "creating or finding instructional materials," "development of different assessments," "looking up current information for both students and myself," and "lesson extensions, ideas for teaching or reinforcing a concept." The next popular task (with 18 total responses) was dealing with administrative activities such as taking attendance and grading. Listed 10 times were student activities such as "practice for student and individualized progress," "composition writing," and "student presentations." Lastly, mentioned a total of 4 times was *communication, between teachers and administration, or with parents and students.* Sample responses from teachers in each category (i.e., instruction or instructional support, administrative activities, and communication) were chosen to create the Round Two survey.

Table 4

Tasks Teachers Most Use/Need/Want Technology For

(25 total responses) Instruction or instructional support	• "creating or finding instructional materials" • "development of different assessments" • "looking up current information for both students and myself" • "lesson extensions, ideas for teaching or reinforcing a concept"
(18 total responses) Administrative activities	• "attendance" • "grading"
(10 total responses) Student activities	• "practice for student and individualized progress" • "composition writing" • "student presentations"
(4 total responses) Communication	• "between teachers and administration" • "between teachers and parents and students"

When asked what changes in software or online applications teachers would most like to see, responses fell into three categories (see Table 5). The first category (with 8 responses) was a desire to simply have more programs available for ESL or Bilingual Education programs. Common responses were "more (quality) programs would help" and "I'd like higher level software for students who are in bridging or transitioning levels. Our Rosetta Stone doesn't go far enough." The second category (also with 8 responses) identified a desire to include more activities or worksheets to go along with the educational program and that incorporate all four skills (listening, speaking, reading, writing). Common responses were "programs which include the components of listening, reading, and writing would correlate to our reading or writing components," "as I use the internet [*sic*] very often, I can say that more reading programs are needed," and "it would be interesting to have activities related to the program, so they could use

Table 5

Changes Teachers Would Like To See

(8 times) more programs available for ESL or Bilingual Education programs	• "more (quality) programs would help" • "I'd like higher level software for students who are in bridging or transitioning levels. Our Rosetta Stone doesn't go far enough."
(8 times) more activities or worksheets to go along with the educational program and that incorporate all four skills (listening, speaking, reading, writing)	• "Programs which include the components of listening, reading, and writing would correlate to our reading or writing components." • "As I use the internet [*sic*] very • often, I can say that more reading programs are needed." • "It would be interesting to have activities related to the program, so they could use them in a deeper way, maybe for homework…"
(5 times) More ESL student-friendly explanations with more native language support	• "Students get lost on websites and use their time making up their mind on where to go/click." • "directions should be simple with less options on websites to minimize confusion"

them in a deeper way, maybe for homework…" The third category (with 5 responses) was a desire to see more ESL student-friendly explanations with more native language support. Common responses were "students get lost on websites and use their time making up their mind on where to go/click," and "directions should be simple with fewer options on websites to minimize confusion." Sample responses from teachers in each category (i.e., a desire for more programs available for ESL or Bilingual Education programs, a desire to have more activities or

worksheets to go along with the educational program and that incorporate all four skills (listening, speaking, reading, writing), and a desire to see more ESL student-friendly explanations with more native language support) were chosen at random to construct the Round Two survey.

When asked what challenges there are in including technology in their classrooms (see Table 6), teachers responded overwhelmingly (18 times) with the lack of computers and access to computer labs and programs as there were limited funds to purchase these items. Common responses were “limited funds to purchase equipment/programs,” “little access in our schools,” “limited equipment/computer labs,” and “only 1 computer available in class and getting into a computer lab on a regular basis is almost impossible due to manifold reasons.” The next category (with 10 responses) dealt with maintenance on the equipment. Common responses were “malfunctions often occur with technology,” “keeping equipment working,” “keeping equipment up to date,” and “getting them [computers] to work consistently.”

The next two categories each had 4 responses, software and poor basic computer skills in students. The most common responses for software were “we have too many software restrictions” and “computer software packages are never exactly what I am looking for.” The most common responses for poor basic computer skills in students were “students have not been exposed to basic computer technology” and “not all students are skilled in using technology.” The response from one teacher seemed to encompass everything.

> It is a challenge to get time in the computer lab, not all students are skilled in using technology; some parents do not consider technology a valid instructional tool; using

Table 6

Challenges In Technology Integration In The Classroom

(18 times) lack of computers and access to computer labs and programs as there were limited funds to purchase these items.	• "limited funds to purchase equipment/programs" • "little access in our schools" • "limited equipment/computer labs" • "only 1 computer available in class and getting into a computer lab on a regular basis is almost impossible due to manifold reasons"
(10 times) dealt with maintenance on the equipment	• "malfunctions often occur with technology" • "keeping equipment working" • "keeping equipment up to date" • "getting them [computers] to work consistently"
(4 times) software	• "we have too many software restrictions" • "computer software packages are never exactly what I am looking for"
(4 times) poor basic computer skills in students	• "students have not been exposed to basic computer technology" • "not all students are skilled in using technology"

technology is not always as spontaneous as print materials—teachers have to plan to incorporate technology in their instruction.

Sample responses of these categories were used to create the Round Two survey.

Teachers' Current Perceptions of Technology Resources: Benefits

When asked what benefits teachers felt there were in including technology in the classroom, three categories emerged (see Table 7). Eleven responses dealt with student motivation as one teacher wrote, "Students enjoy using technology and are more readily

Table 7

Benefits Of Technology Inclusion In The Classroom

(11 times) student motivation	• "students enjoy using technology and are more readily engaged" • "technology increases the numbers of completed work and homework in class and home"
(9 times) technology is a useful tool for teachers	• " I use the computer to learn about new information that is not available in our outdated textbook" • "I use it for the translation of concepts into students [*sic*] home language to enhance understanding of concepts" • "I use it to incorporate pictures and diagrams in my lessons to help explain concepts"
(8 times) technology is a useful tool for students	• "technology gives students opportunities to practice the skills they individually most need to develop" • "more resources are easily available to students through technology; technology brings the world to the classroom"

engaged." Other common responses in this category were that technology increases "the numbers of completed work and homework in class and home."

The second category (with 9 responses) identified technology as a useful resource for teachers, whether the teachers "use the computer to learn about new information that is not available in our outdated textbook" or whether various technological tools are used for the "translation of concepts into students [*sic*] home language to enhance understanding of concepts," or for incorporating "pictures and diagrams" that would explain concepts to students in multiple and differentiated ways.

The third category (with 8 responses) identified technology as a useful resource for students, as one teacher wrote:

> Technology gives the students an opportunity to practice the skills they individually most need to develop. Using technology also provides an opportunity for students to progress at their own rate and see their progress/success. This is especially encouraging (it seems) to the more proficient ELLs who don't feel held back by the other students who don't catch on as quickly when they are using a computerized program.

Addressing this category of technology being useful for students, one teacher responded, "The students are very oriented towards technology and learn well when using it; technology has so many more applications than print materials; more resources are easily available to students through technology; technology brings the world to the classroom."

Results from Round One Survey

Teacher responses from Round One formed major categories in reference to the questions that were being answered. Sample responses of these categories were later used to create the Round Two survey.

Question 1: What are the greatest challenges of including technology in the classroom?

Responses to this question formed these subcategories in rank order of *most* to *least frequently-cited*: (a) availability of computers and access to computers in the lab and programs, and limited funds to purchase them; (b) maintenance on equipment; (c) software issues; (d) poor computer skills in students; (e) no or poor quality teacher training; (f) no time to learn programs.

Question 2: What are the greatest benefits of including technology in the classroom?

Responses addressing this question formed these subcategories in order of *most* to *least frequently-cited*: (a) using technology increases student interest, motivation, participation, and engagement (which also included student easy and comfort using technology); (b) a great resource for teachers; and (c) a great resource for students.

Question 3: What tasks do you most use/need/want technology for in the classroom?

Responses addressing this question formed these subcategories in order of *most* to *least frequently-cited*: (a) lesson planning (which included instructional support resources for translation, and development of different assessments); (b) student grades (which were required by district administrations to be submitted online) and other administrative tasks such as taking attendance; (c) student presentations and practice activities for students; and (d) communication with parents and students as well as between teachers and administration.

Question 4: What changes would you most like to see in software or online applications for classroom purposes?

Responses addressing this question formed these subcategories in order of *most* to *least frequently-cited*: (a) more programs available for ESL or Bilingual Education programs; (b) more activities or worksheets to go along with the educational program and that incorporate all four skills (listening, speaking, reading, writing) activities; (c) more ESL student-friendly explanations with more native language support; and (d) more programs online for free updates.

Round Two Survey

For the second and final phase, participants were given a survey containing sample responses that were the most common and therefore stated more frequently in Phase One. Each participant was asked to complete three tasks: (1) rate each item in importance on a three-unit

rating scale, with one being the *most important*; (2) select the three most important items from the list; and (3) provide a brief rationale for choosing the top three choices. The subjects were given an opportunity to state their rationale for choosing the top three choices in order to determine if additional information could be gleaned.

Since the Delphi technique is an approach to developing a consensus (methodology—Delphi study, n.d.), by determining the aggregate tally of numbered responses from participants, themes that emerged were able to be calculated. The responses teachers gave in Round One formed the categories for Round Two. The most frequently-cited responses from Round One were given back to the participants in a checklist for Round Two. The participants chose their top 3 items and ranked them 1-3 (with 1 being the *most important*). Sometimes a response was chosen the most frequently by all the teachers but may not have been their top choice. It is therefore important to note that achieving a consensus is not the same as achieving a majority (see Table 8).

Answering the question, *Which of the following do you consider the greatest benefits of technology integration in your classroom?* more respondents listed the item "Instruction can be individualized/differentiated" as their top-ranked response. Differentiated instruction has been discussed frequently over the past several years in education (Anderson, 2007; Levy, 2008), however ESL teachers, whose students come to them with varying degrees of English development, have always been concerned about how best to teach students from varying backgrounds, multi-ages and multi-levels, in the same classroom. Teachers believed one of the strengths technology offers them is the individualized instruction that could be easily applied to students at multiple levels.

Table 8

Summary Table of Responses for Round Two Survey

1. Which of the following do you consider the greatest benefits of technology integration in your classroom?	1. Instruction can be individualized/differentiated.	2. Internet can help find information.	*3. Technology increases student interest and participation.
2. Which of the following do you consider the greatest challenges of technology integration in your classroom?	1. Lack of time to learn how to use technology resources.	*2. Computer software packages not suitable for my instructional needs	3. Limited funds to purchase equipment/programs
3. Which tasks do you most use technology for?	*1. Grading/attendance	2. Looking up current information for both students and myself	3. Creating or finding instructional materials, activities, or providing reinforcement.
4. What are the changes in software or online applications you would most like to see?	1. ESL student-friendly explanations	*2. Activities or worksheets to go along with the educational program	3. More programs available for ESL or Bilingual Education programs

* denotes the most frequently-selected response

The item, *Internet can help find information* was ranked second. Rationales that the subjects provided for this item stated that technology assisted language-minority students in expressing their knowledge when their vocabulary was low. The item *Technology increases student interest and participation* was selected most often and was ranked third of the possible responses for what teachers perceived were the benefits of technology integration in their lesson planning. Teachers noticed that students are very enthusiastic about using computers, finding

technology's versatility in helping to demonstrate their knowledge appealing. As one teacher stated,

> I see my students' faces light up when they use the computer or listen to stories on tape or CD. There are many websites and programs on the Internet [that] are very interactive and leveled that students can start from the beginning. The teacher can be a facilitator to help and to give time to special needs students.

Addressing the question, *Which of the following do you consider the greatest challenges of technology integration in your classroom?* the response *Lack of time to learn how to use technology resources* was ranked first. Teacher rationales given following responses to this question cited busy schedules consisting of multiple curricular demands. One teacher responded, "So much is expected of teachers that it is difficult to make the time to learn the technology properly and troubleshoot tech problems for oneself."

The response *Computer software packages not suitable for my instructional needs* was selected most often in response to this question and was ranked second. Rationales cited for this item a lack of suitable computer software that is student-centered or interactive, and one teacher commented, "It seems programs that you buy always have a glitch. I'd like a internet [*sic*] program that keeps getting updated."

The response *Limited funds to purchase equipment/programs* was ranked third. One teacher responded, "Limit for software is an obstacle. Internet sites aren't as detailed as specific software nor as reliable in terms of getting into the site at the time needed." One teacher's lack of computer access to her school was related to the difficulty of finding space.

> You should come to the school and see it for yourself. I have hard-box and 'Neutrogena' (from the beauty store) shelves. My computer is Windows '98 and doesn't really work. The classrooms are tiny. Where and with what money do we place computers? Computer lab? Oh, forget it. It's too small, too.

Reflecting a similar situation was another teacher, who said, "I have a pull-out program at school. Sometimes I teach in the hallway or the gym or in the auditorium. Sometimes I have 6 computers in the room but I have a lot of technical troubles or need memory cards."

In response to the question, *Which tasks do you most use technology for?* the item *grading and/or attendance* was selected the most times and was ranked first.

The item, *Looking up current information for both students and myself* was ranked second among responses given for possible tasks the subjects most use technology for. Teachers stated they often used technology and the Internet to search for new information to enhance lesson planning.

The item, *Creating or finding instructional materials, activities, or providing reinforcement* was ranked third. Websites assisted teachers in finding materials that would reinforce student learning with new or different activities, creating creative extra-curricular projects, or to provide assistance in finding lesson plans. The rationales given by the panel of experts in this study described the current technology resources available to them, such as email. Email was viewed positively by the panel since it facilitated communication between teachers and administrations, and was considered convenient and fast. Emailing parents, however, at least according to one teacher, was still a challenge "because most of them don't have Internet (some of them are illiterate)."

Addressing the question, *What are the changes in software or online applications you would most like to see?* teachers ranked the item "ESL student-friendly explanations" first. Rationales related that "students often get lost on websites and use their time making up their mind on where to go/click."

The item, *Activities or worksheets to go along with the educational program* was selected most often and was ranked second. One teacher said, "I am not a big fan of pre-packed ESL programs, but if we use something, it should be integrated into the curriculum and not an isolated activity." Another teacher said, "I'd like higher level software for students who are bridging or transitioning levels. Our Rosetta Stone doesn't go far enough."

The content of the last item is closely related to the next and final item, *More programs available for ESL or Bilingual Education programs*. Many rationales included the importance of programs that included all four basic components: listening, speaking, reading, and writing. Several teachers reported a desire for more speaking practice, which are seen by them to be quality programs that contain a high degree of interactivity, specifically focusing on providing ample speaking practice for English language learners.

Discussion of the Findings

The first research question of this study was to identify how ESL and BE teachers use technology in their classrooms, as well as to explore the teachers' perceptions of how technology can or presently does meet their needs, and how their experiences with technology and their instructional goals might affect these perceptions.

Based on the results of the present research study, it can be concluded that teachers who have the proper resources utilized several websites and software programs in their instruction,

but most say including technology-enhanced lessons comes with a number of challenges. Their experiences have led them not to depend too heavily on technology as a medium of instruction, and that its inclusion actually takes time *away* from instruction. Given the limited availability of computers and access to resources in many of the schools whose ESL and BE teachers participated in the present study, technology is viewed as a fringe benefit, and not as a classroom staple.

The third research question focused on the strategies ESL and BE teachers employed for integrating technology in instruction. The researcher attempted to find out how they altered or tailored the technologies to meet their needs, how technology assisted them in achieving their instructional goals, and how technology can better meet their needs. The teachers who participated in this study seemed to make the most out of what they had available to them, and many teachers came up with their own instructional materials to accompany information presented through technology. Daily, they achieve their instructional goals and objectives in spite of technology, not usually because of it or even through it. Based on the results from this research study, the principal investigator believes teachers want technology to address more of their needs, first by having more working computers installed, and second obtaining higher quality programs.

As Cuban (1998; 2001) found, the teachers in this study detailed multiple barriers to full technology integration in the classroom. According to the responses made by these teachers, the barriers were either as a result of funding issues due to varying socioeconomic levels (Roblyer & Edwards, 2000) which prevented the teachers from obtaining quality equipment or training, or as

a result of the teachers' own comfort (or rather, discomfort) levels with using technology with students (Prensky, 2005/2006).

Therefore, the results of this study echo the published literature as the benefits to students with regard to technology integration in the classroom are still dependent on many factors (Williams, Boone, & Kingsley, 2004), including teacher innovativeness, availability of equipment, and high-quality packages developed by multimedia companies whose software designers regard teacher input as important, and the fact that there seems to be a scarcity in interesting content (Roblyer, 1988).

Through their responses, the teachers in this study found they had limited time to give their students the individual attention and support to facilitate language growth (Heinze, 2004), yet most explained that their instruction would benefit from incorporating technology into a well-rounded curriculum (Henson, 2006) and not simply adding it an afterthought.

Integrating technology, due to its constant perceived possibility of malfunctioning or the lack of technological resources, is viewed as a risky challenge. It appears there are many more reasons why they do not incorporate IT as reasons for why they do.

In conclusion, teachers in this study desired more working computers, more time to learn how to use software programs, and assistance in running and maintaining the programs and the computers. Concerning the technological resources such as software packages and content-specific websites, respondents in this survey wanted better first language support with more activities to accompany the information and modified instruction.

Chapter Summary

Chapter Four presented the results of the analysis of the data in this multiphase study. The chapter began with an overview of the study, including the research questions which guided the study, a synopsis of the methodology used in the research, and an explanation of the analysis of the data. The results of the study were then presented, and provided answers to the research questions.

The following chapter, Chapter Five, will be the final chapter in this study. It will present the summary and conclusions of the study. It will also discuss the implications for the research as well as provide recommendations for further research.

CHAPTER V: SUMMARIES, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

The preceding chapters of this dissertation presented a problem to be studied (Chapter I), a review of the literature pertinent to this study (Chapter II), methods and procedures used in this study (Chapter III), and an analysis of the data and findings of the study (Chapter IV). This chapter (Chapter V) is the concluding chapter of the present study. It summarizes the study, presents conclusions, implications for educators and instructional designers of educational software, as well as provides recommendations for further study.

Summary

Due to the pervasiveness of technological innovations outside of the classroom, attention may turn to what possible benefits can be gained inside the classroom. More schools are adopting technology resources and building computer labs in an effort to facilitate the availability of computers and computer-enhanced instruction to students. However, as teachers know, a particular piece of software or some other technological advancement can balance or round-out the educational experience for one class of students, but may be inappropriate, confusing, or ineffective for another group of students. Therefore, the question remains---how to best achieve, utilizing available technology advancements, a high level of interactivity, flexibility, and engagement so that each teacher might be able to tailor the item, program, or activity to meet his or her specific instructional needs. An administration of a district cannot simply place a set number of computers inside a school building and consider this *technology integration*.

Thus, the present study has undertaken to explore the level of technology usage in the ESL and Bilingual language learning classrooms. Moreover, the researcher attempted to explore how teachers are presently using technology to achieve their instructional goals. More specifically, the researcher sought answers to the following research questions:

1. What type and level of technology do ESL and BE teachers use in their classrooms?
2. How do ESL and BE teachers use technology in their classrooms?
    a. How do they perceive that technology meets their instructional needs?
    b. How do their experiences and instructional goals affect their perceptions?
3. What strategies do ESL and BE teachers employ for integrating technology into instruction?
    a. How have teachers altered or tailored technologies to meet the needs of their specific classes and students?
    b. How can technology better meet the instructional needs of ESL and BE teachers?

In order to address the purpose of the study and to answer these research questions, the researcher utilized a two-phase research design. In the first phase of the study, the researcher asked participants to complete a survey that consisted of 16 open-ended questions designed to explore the resources currently available to teachers and seek to identify the ways teachers currently use technology in and for their classrooms. The responses to four specific questions from the Round One survey were compiled and summarized from all the participants, forming the content of the Round Two survey. These questions were: (1) What are the greatest challenges of including technology in the classroom? (2) What are the greatest benefits of including technology in the classroom? (3) What tasks do you most use/need/want technology for in the

classroom? (4) What changes would you most like to see in software or online applications for classroom purposes?

The most frequently-cited responses were organized into a checklist. Participants were asked to rank the items in order of most importance on a 3-level rating scale, with 1 being the *most important* and 3 being the *least important* to them. The participants were then asked to provide a brief explanation for why they chose their top three answers.

The principal investigator utilized a modified Delphi study in order to validate the set of questions used in Phase Two of this study. Similar to a Delphi study, a technique successfully used by many researchers for similar purposes, this study used a panel of experts and had multiple rounds (two for this study) for its data collection procedures. This modified Delphi technique, supported by mixed methods, had the advantage of incorporating both qualitative and quantitative methods. This method accomplished the goals of the research study by generating discussion and new ideas through compared experiences, and explored the unique opinions and creative strategies of selected practicing ESL and BE teachers.

Participants in this study, the experts of the modified Delphi panel, were practicing teachers of language-minority students in K-12 classrooms, drawn from 9 schools within 4 school districts. Response rates of 43% and 86% for Round One and Round Two of the survey, respectively, were achieved. These return rates can be considered moderately high given the fact that the participants were full-time, practicing teachers who took the time to participate during the Spring semester, in between federally-mandated standardized testing and the culminating end of the academic school year. A number of the teachers who participated in this study expressed their support for the goal of the current research as well as their interest in the final findings of

the study. Therefore, the researcher of this study will send the interested participants and administrators a report of the study at its conclusion.

Discussion

The greatest benefits of technology integration in the classroom, as reported by the participants, included:

- the ability to individualize and differentiate instruction to meet the needs of the students (Daley, 2003; Groot, 2000; McFarlene et al., 2000),
- the Internet's facilitation of finding information for the teachers (Arvaja et al., 2003; Herron et al., 2000) and,
- the increased student interest and participation when technology was used in lessons (Schofield & Davidson, 2002; Shaffer et al., 2005).

The above results are not surprising to the principal investigator since it is a known fact that teachers continually seek out ways to make instruction meaningful for their students and enjoy the increased engagement from students caused by the appeal of technological resources. Additionally, as in the case of instructing English language learners, technology often assists students whose language skills are underdeveloped and facilitates their demonstration of knowledge and the level of competency they may have achieved in a particular content area (Heinze, 2004; Troia, 2004; Warschauer, 2002).

The greatest challenges of technology integration in the classroom, according to the teacher-participants were:

- the lack of computers and access to computer labs and programs as there were limited funds the teachers had available to them to purchase the equipment or programs (Cuban, 1998; November, n.d.; Williams et al., 2004),
- problems with maintaining the equipment (Williams et al., 2004),
- software issues such as restrictions and the lack of quality programs that were ill-suited for the ESL and BE teachers' instructional needs (Shiratuddin & Landoni, 2002; Sugar, 2001) and,
- poor basic computer literacy skills in students (Cuban, 2001).

Teachers knew they could use technology more creatively but often lacked the time to do so. In addition, some teachers expressed concerns that most of their ESL students came to them with little to no basic computer skills, and had to start out with basic keyboarding just to complete a given task.

The tasks teachers most use technology for included:

- instruction or instructional support such as creating or finding instructional materials or activities, or looking up current information for the teachers and the students,
- administrative tasks such as the reporting of grades and attendance,
- student activities such as presentations or composition writing, and,
- communication between teachers and administration, and teachers and parents.

Most of the teachers were required to report attendance daily and update grades online at the end of each grading period (that typically lasts 6 to 8 weeks), but teachers also found valuable resources online that they felt improved or enhanced their instruction.

The changes in software or online applications teachers would most like to see included:

- more programs available for ESL and Bilingual Education programs,
- more activities or worksheets to go along with the educational program that included all four skills (listening, speaking, reading, writing), and,
- more ESL student-friendly explanations with more native language support.

Conclusions

The findings of this study support the following conclusions:

- It is important to consider teachers' needs and instructional goals in technology integration.
- Teachers are willing to include technology in their instruction but only with the appropriate amount of assistance in learning to use and maintaining the equipment.
- Teachers desire more working computers available to them, even though the labs do not have enough computers for an entire class of students.

The results of this research study offer useful and insightful guidance for integrating technology in schools. In addition, the findings of this study support the acceptance of technology among school personnel within schools but only to the degree of the desired contexts.

In addition, it is important to note that the conclusions in this study were drawn within the limitations and delimitations identified in Chapter I.

Implications

The results of this study corroborate teacher perceptions and instructional needs for integrating technology in the English language learning classroom. Furthermore, after examining the experiences of teachers in this study, who have overcome many challenges of technology-

enhanced language learning, it was found that their creativity is an asset when attempting to teach students through this medium. This study also provides cautionary yet optimistic outlooks on the future of technology in the classroom. The results of this study can be used to improve Instructional and Educational Technologists' understanding of what practicing teachers need in order to include more technology in their classrooms as well as provide guidance to language teachers and their administrations as they consider adopting (more) technological resources for use in the school.

Regarding the perceptions of the teachers in this report, who were not beginning or novice teachers, but rather seasoned educational professionals, it was felt by the researcher that they could view their classrooms objectively and assess where and how technology could provide the greatest benefits. Also, these teachers could offer technology in their instructional sequences to assist in teacher tasks or student tasks, in essence, paying respect to the cultural influences that exist ubiquitously outside the walls of their classrooms. Often, however, technology stays within the shallower waters of support-type resources instead of being efficaciously integrated into the curriculum. Learning with technology and learning through technology have differing outcomes even though the student may accomplish the desired objective of the teacher; in one aspect, technology is used as a medium that assists the student in acquiring the necessary knowledge, in the other aspect, technology itself becomes a learning achievement and greater computer literacy skills become additive rewards.

Since time, or the lack of it, was also a concerning factor among most of the participants, it can then be surmised that even if the teacher had the time to learn the software and integrate it into their instruction, an IT department would still be a needed resource on hand to fix any

software problems or guide the teacher through any hardware malfunctions. Without this support, teachers felt they were limited in what they could do and using technology during a lesson seemed challenging and risky. What happens if the website is down, the computer crashes or the software gets a glitch? It appears there are many more reasons why they do not incorporate technology in the classroom as reasons for why they do.

The majority of teachers in this research study recognized the power of technology to motivate and engage students, to provide individual and student-centered learning, especially important to those who seemed to adopt a constructivist philosophy of teaching that influenced their pedagogy. Most of the subjects were already utilizing resources they felt affected, influenced, or improved their teaching.

Yet the teachers also recognized the limits of technology, especially when implemented in haphazard, under-funded and unsupported, ways. Technology will let you down, they seemed to collectively say, so best to use it sparingly, which most of the teachers were, whether by their own choice or not.

Students are already learning with technology in their own pastimes and hobbies, through videogames and devices they use for personal uses as a way to obtain and negotiate the information they receive. Therefore, teachers have an important and ethical duty to teach to the abilities their students have. In today's classroom, this includes incorporating more technological aspects and components into everyday instruction.

In meeting the realities of technology in the researcher's own classes, mention of the inequities of school resources are made to students. In these sessions, some students, who are teachers from wealthier suburban and urban schools, will compare the lack of technology in

schools at the time of Anyon's (1980) study with today's progress of computer additions and computer labs in schools. However, many of these students are under the erroneous assumption that their school in which they teach is the norm. Since their school enjoys a large number of new, well-maintained computers and a large lab, doesn't everyone's? Other students will then add their own accounts of limited technology resources, typical to what the research shows in this study. However, regardless of what is available inside their school buildings, there is still the question of what is—or is not—available at home. Socioeconomics continues to play a part in access to technology, as evidenced through this research study's teacher responses, whose students often come to them without basic computer knowledge. Just as in Anyon's (1980) research on classrooms uncovered hidden curriculums, and access and privilege to education, there is still a powerful association between social and economic disadvantage and low student achievement.

America's current education policy embodies the philosophy that schools alone can make up for the disadvantages caused by low socioeconomic status. The No Child Left Behind Legislation largely ignores the gaps of low socioeconomic students (Giroux & Schmidt, 2004) that are present before the child even begins formal schooling, gaps that continue to widen as the child progresses in grade levels, in schools that may have a lot of funding or not enough.

Funding laptops for use in the classroom has become a common occurrence, as reported by one school in this research study. But criticisms to laptop inclusion are also becoming just as popular as they can affect the interaction and engagement that goes on in the classroom in negative ways. Leander (2007) describes the problem as "the damaged classroom interaction space" (p. 40) in which laptops given to students can result in reduced classroom interaction and

discussion. Use of classroom laptops may also result in distractions (off-task behavior), physical barriers (i.e., laptops may shield student eyes and activities from the teacher), and small classroom spaces feeling crowded, space taken up by "laptops, cords, power strips, new desk arrangements (to allow for monitoring), computer cases, and books on the floor" (Leander, 2007, 40). Leander (2007) found that students with laptops act as if they are at home, engaging in personal activities (e.g., shopping online, instant messaging) when they are supposed to be working on an assignment. A highly-prescribed curriculum in the NCLB era, devoid of time available to explore student interests, suggests teachers are more likely to think technology gets in the way of teaching instead of enhancing or supporting it.

One important criticism of laptop programs starts with the name itself.

> First of all we should never call any program a 'Laptop Program.' We certainly do not have pencil and paper programs. As soon as a school or district places the focus on the technology I believe it is doomed to fail. The real work is not adding technology to our industrial school design, but reengineering the culture of teaching and learning. (November, n.d., para. 3)

An equally important criticism is the fact that early adopter schools are now abandoning computer-dependent programs due to high maintenance costs and student distractions. Additionally, teachers have not changed the way they teach, so that the ways in which laptops are actually used in the classroom are very limited.

At a recent Games+Learning+Society conference the researcher of this study attended (July, 2008, Madison, WI), Dr. Constance Steinkuehler said of her husband's (Dr. Kurt Squire) experiences of implementing handheld computer devices in a particular school, that the

administration rejected the device's abilities to communicate with other students and access the Internet (informal chat session, July 10, 2008). Taking away these functions, the device was little more than a digital notepad, giving credence to the criticism that laptops in schools, due to constraints and restrictions placed on them by the administration and faculty, become "$2000 pencils" (November, n.d., para. 1).

The utilization (user-friendliness) of technology and technological resources must be considered in addition to previously mentioned criticisms (Cuban, 1986). "As far as the customer is concerned, the interface *is* the product" (Raskin, 2000, p.5). These statements are reflective of the challenges that many of the teachers in the present study experienced when they attempted to implement technology-enhanced lessons.

Any software program must address the needs of the teacher while proving not to be overwhelming to use. "The tools that teachers have added to their repertoire over time (e.g., chalkboard and textbooks) have been simple, durable, flexible, and responsive to teacher-defined problems in meeting the demands of daily instruction" (Cuban, 1986, p.58). Conditions in the environment have to be met to support this addition; technology assistance must be made easily available if this component is going to be added to a teacher's lesson plans, especially for less computer-savvy teachers.

> [In fact] Teachers will alter classroom behavior selectively to the degree that certain technologies help them solve problems they define as important and avoid eroding their classroom authority. They will either resist or be indifferent to changes that they see as irrelevant to their practice, that increase their burdens, without adding benefits to their students' learning or that weaken their control of the classroom. (Cuban, 1986, p. 70-71)

This sentiment was also expressed by Dockterman (1991) who reported that teachers would respond more favorably to implementing educational software if the right technology support was given that would not hinder or cause conflicts with "teacher control, pedagogical flexibility, and accessibility" (p. 136). Alternately, these teachers responded that student engagement is high when technological aspects are included in the classroom. For this generation of students who never knew life without the Internet's existence, it is little wonder that they show disinterest in classrooms because of having to "power down" (Prensky, 2005, p. 64). There is no doubt that student ease, comfort, and familiarity with technology is high as their world has always included computers, the Internet, and many technological gadgets that did not exist for previous generations (Prensky, 2005; 2005/2006).

Leander (2007) compared Hodas' (1993) article of technological innovations' inability to reform the culture of schooling, mainly because all technologies are value-laden, and this includes schooling, also a technology. And instead of thinking of this as a failure, Hodas contends that schools are "doing exactly the jobs they were set up to do and have been refined over generations to perform" (Hodas, 1993, as cited in Leander, 2007, p. 26).

This sociological view of education is what Leander draws from to argue that in order to understand technology and schooling, and the acceptance of technology within schools, one must consider "the production and organization of school space and time" (Leander, 2007, p. 26). He further contends that the challenge of bringing technology into schools is not technical, with the provision of hardware and software, but spatial and temporal. Items like the blackboard and the overhead projector (which direct student attention to a common area), and copiers encourage a common activity shared by all the members of the class. Activities on individual monitors do not

match this type of desired productivity. Even learning management systems such as *Blackboard* (2008) simply make use of teacher control online, and do not encourage individual participation like the web-based tools students use to create videos or music compilations.

Can these challenges be solved through simply providing more time and money? The lack of funding certainly creates obstacles in the way of overcoming these challenges, but the lack of time is inarguably even more devastating. How can teachers truly give students the highest quality of instruction if they are not given adequate time, proper tools, necessary power, space for self-discovery, and collaborative opportunities for shared learning and teaching with other professionals? The results of this research study suggest that technology has still not been completely integrated into schools, implemented into the curriculum, and due to the lack of both time and money, it is still viewed and treated as a *fringe benefit*. It is not that technology has been tried in the classroom and been found unsatisfactory, at least within some schools, it has not been even tried properly so that benefits or advantages to its inclusion can be attained. It is vividly clear that certain limitations such as the lack of time and money, and space in some instances, did hamper teachers' abilities to include more technology in their lessons and affected their views and perspectives on technology inclusion in the classroom.

But, the question of *how* to more adequately fund technology programs in schools is not likely to be answered soon. Enhancing Education Through Technology (EETT) was authorized as part of NCLB and has undergone significant cuts in funding since it was first implemented in 2002 ("ISTE says President's proposed budget fails American students," 2007, para. 4). The goals of this program seek to assist the nation's students in competing globally in math and science through providing exposure to technology tools and increasing the skills required to use

these resources. Funds from EETT to states are distributed to school districts and used to provide professional development, training, enrichment programs, and integration purposes intended to increase technology literacy in students. Since 2004, many states have undergone major cuts in EETT funding. Iowa was funded at 3 million dollars in 2004 but saw their budget reduced to 1 million dollars each in 2006 and 2007. Pennsylvania had 22 million dollars in 2004 and had 9 million dollars each in 2006 and 2007. Wisconsin had 8 million dollars in 2004 which was cut to 3 million in 2006 and 2007 ("ISTE says President's proposed budget fails American students," 2007, para. 6).

Educational technology and the emphasis on learning through technology is recognized as having a crucial role in the proficiency of digital technologies and in encouraging and developing computer literacy across multiple disciplines. History has recorded that the challenge of improving student achievement and transforming education through technology was negatively impacted by the former U.S. president's proposal of budget cuts.

In addition to the lack of time and money, there is still a psychological factor not to be ignored whilst integrating technology in the classroom. While technology can enhance relationships and bring people together (multiple readers for a single blog, online games that create a community, emails and e-pen-pals from people in far-away places), it also has an impersonal factor about it that makes it too easy to dismiss. Emails can be deleted, and online surveys, with an invitation to participate, can be ignored. The fact that only 6 subjects filled out the *online* Round One survey instrument, out of a possible 49 grand population contacted by the researcher to participate in the present study, and yet an additional 15 completed the *paper* survey, bears out this factoid. It also signifies that a paper version of the survey could be viewed

by some of the teacher subjects as being more *real*, more substantial, and therefore having more compelling reasons to complete.

It is perhaps beside the point to say that schools have greatly increased their interest in computers, with more computers in low to high socioeconomic neighborhood schools than ever before. It may also be beside the point to say that more schools now have computer labs than ever before, as labs typically offer first-come, first-serve policies for numerous teachers who would like to incorporate technology-enhanced lessons but cannot get into the computer laboratory due to scheduling conflicts. Furthermore, the results of this research study suggest that more school districts are offering technology training. Yet the training is usually on programs the district has not or will not be providing for the teachers, or is not content-specific nor content-tailored enough so that teachers feel the time invested in the required days of attendance at training sessions is valid.

School districts may suffer from uneven reserves: schools are either rich in technology resources and poor in having staff educated in implementing them effectively, or they are motivated to integrate technology but unable to acquire the resources to do it. Furthermore, much like Direct Instruction is criticized for not developing critical thinking skills in students, technology in the schools in this study rarely went beyond basic computer and keyboarding usage. The panel of experts in this study expressed the sentiment that educational software is not well-designed for effective use in their classrooms. Furthermore, how technology is implemented, and to what degree, are important considerations in determining effect and outcome on student achievement. Technology has the potential to be used as a tool of inquiry

and advance academic and disciplinary knowledge, as it also has the potential of reproducing the *status quo* for marginalized and working-class students.

However, it is very much to the point to say that if a school understands the need for computer literacy skills in children by providing the equipment, by not providing greater access to computer labs, more assistive teacher training, the proper personnel to offer maintenance, and more funding for better software programs, not much good can come from a shiny, new, and empty (or possibly broken) computer lab.

There is also the consideration that while computers are becoming more available in schools, the lack of computers in the home is still a growing problem that any teacher who teaches with technology must consider. Technology is in great danger of maintaining the heretofore educational *status-quo*; students from higher socioeconomic backgrounds will have greater access to technology in their homes, while poorer students will still not be able to afford a computer for at-home use. In this regard, assessing students by their abilities using technology creates new ways of ensuring that poor children will still be inadequately prepared for future academic success as well as many careers after graduation. Anyon's (1980) research must challenge educational technologists and educators to consider ways in which technology will not encourage the framework of social reproduction (Warschauer, 2003).

With more research focused on the content and instructional needs of classroom teachers, researchers and software developers can change the state of technology-enhanced language teaching so that more issues are addressed and their needs are met, not only for the teachers, but for their students as well. Who knows what types of high quality programs will be available when teacher concerns are finally taken into consideration by educational software companies?

With the proper hands-on training and assistance given to teachers, who knows where they will stretch their abilities and creativity in lesson planning so that their students do not end up being denied effective strategies that will serve to produce within them a strong foundational base of computer literacy knowledge?

A partnership between the software companies that produce educational software and the teachers who will be buying and utilizing their products must be a key factor in software development. This collaboration must start at the beginning of any content area project. Consultants for these projects should not (only) be researchers, administrators, stakeholders, policymakers, or curriculum developers who have little to no actual experience in K-12 settings, but the very teachers who will be using the products with their students. Therefore, more collaboration is needed between educational software companies, and the teachers who will actually be buying and using the programs for their students. This focus on classroom teachers by educational companies has barely begun (Williams et al., 2004). However, most decidedly, the time is at hand when teachers can no longer be left out of the decisions of how and when to include technology in the classroom, either by software companies, by their administrations, or class schedules that leave little to no room for technology-enhanced language learning.

This research shows that, according to the opinions given of the panel of experts, technology often impedes most teaching, that it can be used at times to enhance, support, or improve traditional instruction but at this time cannot replace it.

Recommendations

The results of this research study have presented the perceptions of a select teacher panel of experts *vis-à-vis* the use of technology in the ESL and BE classroom and found that it can

often impede teaching, as well as the fact that it can be used at times to enhance, support, or improve traditional instruction. It cannot, at this time, replace it.

Based on these results, then, the following recommendations are suggested for further study:

1. A replication of this modified Delphi study is recommended to be conducted with a larger and more diverse population, in more regions of the country, including rural areas. Since the low number of participants offered only a small look into teachers' experiences, it would be helpful to obtain more teachers who would contribute to the study, and include those teachers from rural settings who may have different perspectives.
2. Only one type of research method was used for this study, a modified Delphi study. Adding additional approaches would have allowed for triangulation of findings.
3. Further research needs to be conducted on how learners construct or co-construct knowledge through technology, perhaps through a cognitive science perspective. Most of the language arts teachers in this study chose to use limited types of technology such as PowerPoint and MS Word. An understanding of a broader base of technology usage and how it affects, alters, and enhances cognitive development would add deeper dimensions to instructional programs as well as to the methodology of teachers.
4. True technology integration must take place before its effectiveness can be definitively assessed in this, as well as other studies, as administrations and teachers who selectively utilize only part of the capabilities offered though some technological devices are left with little functionality.

5. Further research needs to focus on administrations and their systems of providing *safety bumpers* which effectively limit the engaging opportunities and possible beneficial effects of a technology-enhanced curriculum.
6. A closer look at schools similar to those examined in this study, that recently provided funded laptops to 6th and 7th graders, could provide greater understanding behind the decision of schools to implement laptops as well as show the results of the safeguard measures intended to protect students.
7. Care should be given if computer labs will be housed within the libraries of schools. Due to the fact that these spaces are combined areas, it is difficult to imagine instruction when one class is using the computers and another class might be using the library's services. If scheduling is arranged by the school to prevent use of both facilities at the same time, this may further limit the time teachers and their students would have for computers.
8. Lastly, there is a need for caution when considering the purpose for, the possible benefits from, and the limits of integrating technology. Dependent on the ways a technology-enhanced curriculum is implemented, it will either serve to engage students (Gee, 2003; Prensky, 2005) or result in very expensive mistakes (Cuban, 1998; November, n.d.).

It is hoped that this research will contribute to the research on technology integration in the classroom and how best to achieve positive results, as well as to provide guidance for administrations and teachers who desire to include more technology-enhanced language teaching.

Chapter Summary

This chapter presented a summary of the study, including the purpose, the literature review, methods and procedures employed to answer the research questions, findings, and conclusions. Also, the implications of the research were discussed and recommendations for further study were presented.

Following this chapter is a list of References as well as Appendices, including the cover letters used to contact the participants of the study, and the surveys used in Round One and Round Two of the modified Delphi study presented in this dissertation. The researcher's vita appears at the end of this dissertation.

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APPENDICES

Appendix A

Round One Survey Instrument

ESL and BE Teacher Perceptions of Technology Integration in the K-12 Classroom
A Questionnaire for ESL / BE Teachers

Section A
Please answer the following questions. Your responses will assist in the categorization of responses.

1. Please indicate your gender: M_____ F_____

2. Please indicate your position title:
ESL:_____ BE:_____ or Other (please fill in):_____

3. Please indicate the grade level(s) you teach (please check all that apply):

___Pre-K	___4	___9
___K	___5	___10
___1	___6	___11
___2	___7	___12
___3	___8	

4. What subject area(s) do you teach (please list all that apply):

_____

_____

5. How many years have you taught (including this year)?

_____ number of years

6. Is your school a Title 1 school? Yes_____ No_____

7. What is the percentage (approximately) of students at your school who qualify for free and reduced lunch?

_____%

Section B
Please read each question and write a brief response for each.

1. Please list what you consider to be the greatest benefits of including technology (e.g., computers, computer software packages, or online applications) in your teaching.

2. Please list what you consider to be the greatest challenges of including technology (e.g., computers, computer software packages, or online-applications) in your teaching.

3. What tasks (e.g., instruction, instructional support, grading) do you accomplish using technology?

4. What are the names of some computer-based programs you use…

   a. for instructional purposes?_____

   b. for grading purposes?_____

   c. for student use?_____

5. What problems, if any, do you have with computer-based programs you use most often?

6. What adaptations have you made in order to use available computer-based programs effectively?

7. What changes would you like to see in educational software packages or online applications to better meet the needs of your students?

8. What type of technology training have you received?

9. What is the availability of computers in your classroom or lab?

Section C
Please write any additional comments you may have concerning the inclusion of technology in your classroom.

Thank you for completing this survey.

Appendix B

Introduction to Online Version of Survey

ESL and BE Teacher Perceptions of Technology Integration in the K-12 Classroom

Length of Time Estimated to Complete Round 1: 10-15 minutes

Introduction:
Advances in technology and technological gadgets have caused an explosion of interest not only for the general public, but attention has turned toward the classroom and what it can gain from these innovations.

The purpose of this study is to examine the experiences of ESL and BE teachers who integrate technology in their classrooms. It will explore the perceptions of teachers who would like to include more technology-enhanced language learning strategies in their teaching, and also help determine the reasons teachers may be resistant toward including technology-enhanced lessons in their classrooms.

Next | Stop

Appendix C

Information Sheet

ESL and Bilingual Education Teacher Perceptions of Technology Integration in the K-12 Classroom

Dear Participant:

You are invited to participate in a research study. The purpose of this study is to explore the type and level of technology integration of English as a Second Language and Bilingual Education teachers. This includes what challenges you experience in integrating technology and what strategies you employ to overcome the challenges.

INFORMATION

Your participation in this study includes two questionnaires that will be mailed to you or sent to you via an online questionnaire. During the first round, you will be asked to either complete a questionnaire in short answer completion format and return it in the postage-paid envelope or access the online questionnaire. Once responses have been analyzed and reorganized, you will then receive a second questionnaire in which you will be asked to rank the construct in the order of importance, providing a brief explanation for why you chose the top three choices. If completing the questionnaire by hard copy, you will return the second questionnaire in the postage-paid envelope provided for you. Once analysis is completed for the study, all questionnaires will be destroyed.

RISKS

There are minimal risks involved in participating in this study. The information found in the study will be used as a doctoral dissertation. Furthermore, it may be published in research journals or may be presented at professional conferences. Any information provided that could reveal your identity, including your name, will remain confidential and anonymous in any published materials.

BENEFITS

The findings of this study can contribute to the body of knowledge about ESL/BE teachers' issues in integrating technology in their classroom practice. Furthermore, this study cannot only be conducive to designing and implementing technology-enhanced curricula for TESOL and Educational Technology teacher education programs, but can also assist educational software

designers with product design that will better suit teachers' needs. Lastly, this study will help teachers who may have previously shown resistance to or are unsure of how to integrate technology effectively in their classroom. However, participant benefits are incidental.

CONFIDENTIALITY

The information in this study will be kept confidential. Data will be stored securely and will be made available only to the person conducting the study unless you specifically give permission in writing to do otherwise. No reference will be made in oral or written reports which could link your identity to the study.

CONTACT

If you have questions at any time about the study or the procedures, you may contact the researcher, Yurimi Grigsby, at 100 Des Plaines Ave., Forest Park, IL, 60130, 708-209-3624, and ygrigsby@utk.edu. If you have any questions about your rights as a participant, contact the Research Compliance Services section of the Office of Research Compliance Officer at The University of Tennessee, Knoxville, at 865-974-3466.

PARTICIPATION

Your participation in this study is voluntary; you may decline to participate without penalty. If you decide to participate, you agree to participate in the two rounds of questionnaires described above. However, you may withdraw from the study at any time without penalty and without loss of benefits to which you are otherwise entitled. If you withdraw from the study before data collection is completed, your data will be returned to you or destroyed. Return of the completed questionnaire constitutes your consent to participate.

_____

Yurimi Grigsby
Ph.D. Candidate
World Language / ESL Education
The University of Tennessee, Knoxville

Appendix D

Letter of Invitation to Superintendents' Offices

TO: District and Administrative Personnel of Chicago Public Schools
FROM: Yurimi Grigsby, Assistant Professor at Concordia University Chicago and
PhD candidate at The University of Tennessee, Knoxville
RE: Conducting (teacher) research in Chicago Public Schools
DATE: January 20, 2008

I would like to ask for your help with a research study. My name is Yurimi Grigsby, and I am an Assistant Professor of Teacher Education at Concordia University Chicago. I am also a doctoral student in ESL Education at The University of Tennessee, Knoxville. For my dissertation research I am studying the experiences of English as a Second Language (ESL) and Bilingual Education (BE) teachers who utilize some form of technology in their classroom.

The purpose of my study is to examine the experiences of ESL and BE teachers who integrate technology or would like to include more technology-enhanced language learning strategies in their teaching. I am seeking teachers who are willing to answer two questionnaires about their experiences and opinions about using technology in the classroom. Teachers who wish to voluntarily participate will complete two questionnaires: one in March 2008 and one in May 2008.

In order to better understand teachers' experiences, I will conduct two rounds of questionnaires with ESL or BE teachers from participating school systems. I would like to include teachers from your school system in this study.

With your permission, I would like to administer a survey to your ESL and BE teachers. A copy of the first questionnaire is enclosed. The Delphi method that I am using will use the responses from the first questionnaire to compose the categories for the second questionnaire.

The survey is anonymous; responses cannot be linked to individual teachers. In addition, each school site will be kept confidential and will not be identified by name in the written reports of this research. If you would like a copy of the final report, I will provide you with one.

I would like to contact your teachers through their school's email address in February and administer the questionnaires to participating teachers via their preferred mailing address or an online link. I realize time is in very short supply for you and your teachers, and I have tried to make the survey as brief as possible. The survey has been piloted, and the average time needed for teachers to complete it is between 10 and 15 minutes.

I hope you will consider allowing your district teachers to participate in this study. Participation in this study will help reveal the needs of ESL and BE teachers in Chicago's urban and suburban

areas and identify the challenges and complexities in integrating technology in the language learning classroom.

What I need from you at this stage is written confirmation that I have the permission of the district to conduct this study pending IRB approval. The University of Tennessee's IRB policy is such that I need this permission on file before I will be granted IRB approval from the University of Tennessee's Research Office. If I am granted permission at the superintendent's level to conduct the research study in the school system, I will then contact principals at school sites for their permission to contact their teachers. Written permission letters from both the superintendent's office and principals' offices will be filed with the University of Tennessee's Research Office in order to obtain IRB approval. Once this approval has been granted, I will then contact teachers and offer an invitation to participate in the research study.

If I can answer any questions you have or if I need to provide additional or clarifying information, please do not hesitate to contact me at your convenience. I have listed my contact information below my signature.

Thank you for your time and attention.

Sincerely,

Yurimi Grigsby
100 Des Plaines Ave.
Forest Park, IL 60130
ygrigsby@utk.edu
708.209.3624

Appendix E

Letter of Invitation to School Principals

Dear Principal _____,

I would like to ask for your help with a research study. My name is Yurimi Grigsby, and I am an Assistant Professor of Teacher Education at Concordia University Chicago. I am also a doctoral student in ESL Education at The University of Tennessee, Knoxville. For my dissertation research I am studying the experiences of English as a Second Language and Bilingual Education teachers who utilize some form of technology in their classroom.

The purpose of my study is to examine the experiences of ESL and BE teachers who integrate technology or would like to include more technology-enhanced language learning strategies in their teaching. I am seeking teachers who are willing to answer two questionnaires about their experiences and opinions about using technology in the classroom. In order to better understand teachers' experiences, I will conduct two rounds of questionnaires with teachers from participating school systems. I would like to include teachers from your school in this study. Teachers who wish to voluntarily participate will complete one questionnaire in March 2008 and one in May 2008.

With your permission, I would like to administer a survey to your ESL and BE teachers. A copy of the first questionnaire is enclosed. The Delphi method that I am using will use the responses from the first questionnaire to compose the categories for the second questionnaire.

The survey is anonymous; responses cannot be linked to individual teachers. In addition, each school site will be kept confidential and will not be identified by name in the written reports of this research. If you would like a copy of the final report, I will provide you with one. I have gained permission to conduct this study through the Office of Research at The University of Tennessee, Knoxville, in Knox County, Tennessee.

I would like to contact your teachers through school email in February. Those who would like to participate will contact me with their mailing address or indicate that they would rather complete the survey online. I will mail teachers the first questionnaire or provide them the online link, along with an informed consent form. Participating teachers will complete both the short-answer questionnaire and the informed consent form. For those who completed the survey on paper, they will mail them back to me in a self-addressed stamped envelope provided for them.

I realize time is in very short supply for you and your teachers, and I have tried to make the survey as brief as possible. The survey has been piloted, and the average time needed for teachers to complete it is between 10 and 15 minutes.

What I need from you at this time is written confirmation that I have your permission to conduct this study in your school. The University of Tennessee's IRB policy is such that I need this permission on file before I will be granted IRB approval from the University of Tennessee's Research Office. Once I have obtained IRB approval from the University of Tennessee and with your permission, I would like to contact your ESL and Bilingual Education faculty to request their participation. If requested, I will be happy to schedule a meeting with your ESL or Bilingual Education faculty after school hours to meet with your teachers or clarify my research objectives.

I hope you will consider allowing your teachers to participate in this study. Participation in this study will help reveal the needs of ESL and BE teachers in Chicago's urban and suburban areas and identify the challenges and complexities in integrating technology in the language learning classroom.

If you would like more information please contact me at (708) 209-3624, ygrigsby@utk.edu, or at 100 Des Plaines Ave. Forest Park, IL, 60130. I will contact your office soon to discuss the possibility of conducting this research study at your school.

Thank you for your time and attention.

Sincerely,

Yurimi Grigsby
Ph.D. Candidate
Foreign Language / ESL Education
The University of Tennessee, Knoxville

Appendix F

Teacher Invitation to Participate in the Study

Dear _____ (ESL/BE teacher),

My name is Yurimi Grigsby, and I am an Assistant Professor of Teacher Education at Concordia University Chicago. I am also a doctoral student in ESL Education at The University of Tennessee, Knoxville. I have been given permission by your district's and school's administration to conduct a research study at your school. I would like to ask for your participation.

Advances in technology and technological gadgets have caused an explosion of interest not only for the general public, but attention has turned toward the classroom and what it can gain from these innovations. The purpose of my study is to examine the experiences of ESL and BE teachers who integrate technology or would like to include more technology enhanced language learning strategies in their teaching. I am seeking teachers who are willing to answer two questionnaires about their experiences and opinions about using technology in the classroom.

The first questionnaire is a questionnaire in short answer completion format and estimated time needed to complete it is approximately 15 minutes. You may choose to complete this survey either by hard copy or online. A hard copy or link to the online questionnaire will be provided to you, according to your preference.

Approximately two months later, you will then receive a second questionnaire (via your preferred method) for which you will be asked to rank the items in the order of their importance to you, and then provide a brief rationale for why you chose your top three answers. The estimated time needed to complete the second questionnaire is approximately 15 minutes. You will complete one questionnaire in March of 2008 and one questionnaire in May of 2008.

Participation in this study will help reveal the needs of ESL and BE teachers in Chicago's urban and suburban K-12 educational arenas and identify the challenges and complexities in integrating technology in the ESL/BE classroom. I deeply appreciate your willingness to share your experiences, expertise, and opinions.

If you are interested in participating in this study, please contact me by February 29 at ygrigsby@utk.edu, (708) 209-3624, or at 100 Des Plaines Ave., Forest Park, IL, 60130. You will be asked to indicate to me your preferred method for completing the survey. I will send you an informed consent form to your school's mailing address, along with a self-addressed stamped envelope.

If you have any questions or concerns, please do not hesitate to contact me for further information. If you would like to schedule a meeting after school hours to explain my research objectives or clarify the study or your involvement within it, I will be happy to meet with you.

Thank you for your time and attention.

Sincerely,

Yurimi Grigsby
Ph.D. Candidate
World Language / ESL Education
The University of Tennessee, Knoxville

Appendix G

Pilot Study Cover Letter

Dear ESL/BE teacher,

Thank you for participating in this pilot study. The attached survey is part of a dissertation research study entitled *ESL and Bilingual Education Teacher Perceptions of Technology Integration in the K-12 Classroom.* Advances in technology and technological gadgets have caused an explosion of interest not only for the general public, but attention has turned toward the classroom and what it can gain from the innovations. The purpose of my study is to examine the experiences of ESL and BE teachers who integrate technology or would like to include more technology enhanced language learning strategies in their teaching. In order to ensure the quality of the survey devised for the study, I would like to invite you to participate in the piloting of this instrument. Your input on this survey is extremely helpful. None of the survey data gathered in this pilot study will be included in the final analysis of the data. It is your input on the instrument itself that I am interested in.

After completing the survey, please answer the feedback questions on the last page of this packet. Thank you for participating in this research project. Your input is critical to the success of the study.

Please feel free to contact me at (708) 209-3624 or ygrigsby@utk.edu if you would like further information on this study.

Thank you for your time and attention.

Sincerely,

Yurimi Grigsby
Ph.D. Candidate
Foreign Language / ESL Education
The University of Tennessee, Knoxville

Appendix H

Feedback Questions on the Pilot Study

Feedback Questions
Please answer the following questions after completing the survey.

1. Which, if any, items on the survey were unclear to you? (*Please explain.*)

2. Which, if any, items did you find difficult to answer? (*Please explain*.)

3. Approximately how long did it take you to complete the survey?

4. In your opinion, which, if any, items on the survey display a bias on the part of the researcher?

5. Please provide any additional comments you would like to make.

Thank you for participating in this pilot study.

Appendix I

Cover Letter for Round Two Survey

May 12, 2008

Dear Teacher of English language learners:

Recently you completed the first round of a research project entitled "*ESL and Bilingual Education Teacher Perceptions of Technology Integration in the K-12 Classroom*." Round 1 took less time to analyze than was initially anticipated. Your participation in that round was very much appreciated as your comments provided valuable insight into the benefits and limits of technology use in the language learning classroom.

At this time, I am asking that you complete the second (and final!) round of this research study. Estimated time to complete it is between 5 to 10 minutes. After Round 2 is complete, I will send each district (and participating teacher if requested by email) the results of the study. Your anonymity and location is protected, and individual responses cannot be linked to teachers.

Your willingness to participate is much appreciated. If you have questions at any time about the study or the procedures, you may contact the researcher, Yurimi Grigsby, at 100 Des Plaines Ave., Forest Park, IL, 708-209-3624, and ygrigsby@utk.edu. If you have any questions about your rights as a participant, contact the Research Compliance Services section of the Office of Research Compliance Officer at The University of Tennessee, Knoxville, at 865-974-3466.

Thank you for your valuable time and attention.

Sincerely,

Yurimi Grigsby
Ph.D. Candidate
World Language / ESL Education
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Appendix J

Round Two Survey Instrument

ESL and BE Teacher Perceptions of Technology Integration in the K-12 Classroom
A Questionnaire for ESL / BE Teachers

To the participant:
The following survey is divided into four sections. Within each of the sections, please review the list of choices and rate your top three answers (1-3, with 1 being most important). Then provide a brief explanation for why you chose your top three.

I. Which of the following do you consider the greatest benefits of technology integration in your classroom?

_____Concepts can be translated to enhance understanding.

_____Grammar software is available for practice.

_____Technology increases student interest and participation.

_____Word processing applications save time.

_____Pictures and diagrams can explain concepts.

_____Students are more comfortable and familiar with the idea of technology

_____Internet can help find information.

_____Technology helps introduce new knowledge easier.

_____Technology can help students build language skills.

_____Instruction can be individualized/differentiated.

Rationale:

II. Which of the following do you consider the greatest challenges of technology integration in your classroom?

_____getting time in the computer lab

_____number of computers available

_____computer software packages not suitable for my instructional needs

_____lack of computer skills in students

_____lack of instruction from IT teachers

_____keeping equipment up to date and maintained

_____lack of time to properly introduce and teach

_____limited funds to purchase equipment/programs

_____lack of space

_____lack of time to learn how to use technology resources

Rationale:

III. Which tasks do you most use technology for?

_____communicating with teachers, administrations, parents, or students

_____looking up current information for both students and myself

_____grading and/or attendance

_____creating or finding instructional materials, activities, or providing reinforcement

_____translating or to improve instruction for ESL students

_____developing different assessments

_____providing reading, writing, listening on an individual level

Rationale:

IV. What are the changes in software or online applications you would most like to see?

_____more native language support

_____programs with more listening, reading, and writing components

_____more interesting and fun speaking practice

_____larger print or audio component for special needs kids

_____ESL student-friendly explanations

_____programs online that are updated without having to buy additional materials

_____activities or worksheets to go along with the educational program

_____more problem-solving activities in all areas

_____more difficult software programs

_____less options on websites to minimize confusion

_____more programs available for ESL or Bilingual Education programs

Rationale:

Thank you for completing this survey.

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Yurimi M. Grigsby is an Assistant Professor in the Curriculum & Instruction Department at Concordia University Chicago, Illinois, where she teaches graduate students on the instruction of English language learners. Before coming to Concordia, she taught high school Spanish and ESL (K-12) in Tennessee. She received her Bachelor of Arts in Spanish and Master of Arts in Teaching Secondary Education degrees from East Tennessee State University in 1996 and 1999, respectively. Ms. Grigsby was a graduate teaching associate at The University of Tennessee for three years where she supervised language intern teachers and co-instructed with Dr. Patricia Davis-Wiley, Professor, WL/ESL Education. In addition, she taught the Introduction to Secondary Schools and Field Experience for Teaching for English and World Language Interns.

She has presented her academic research at local and international conferences. Her research interests include: heritage language maintenance and loss, sociolinguistics, and videogaming as a situated, apprenticed, and social activity.